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Today's children receive information in relatively unstructured form through communications media which surmount barriers of time and space. In comparison, traditional sequential learning may seem slow and uninteresting. Technological innovation in education would make it possible to place emphasis on student discovery through informative media, an approach which is to be preferred over two popular communications theories which place greatest importance on clear, orderly transmission of messages, or on persuading a person to display a desired terminal behavior. No single innovation will solve all the problems of educators. A variety of teaching methods will always be needed, especially if the "dehumanization" often expected of machine-oriented media is to be avoided. Laymen may assume from press coverage of atypical schools and from the lipservice given technological innovation by educators that modern media are being fully utilized. In fact, educators, for reasons of prejedice or ignorance, have not made full use of them. Information services, adequate training for teachers, and prototype units for experimentation and demonstration would facilitate acceptance of new methods. Research into methods available, and studies to aid administrators in budgeting adequate funds and evaluating equipment are also needed. (RM)

TECHNOLOGY IN LEARNING

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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... LEARNING ...

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.... for their gracious co-operation in recording the messages which are included on discs in this report

Dr. Hans Moller and Mr. Mark Slade
National Film Board ....

.... for their invaluable advice and assistance

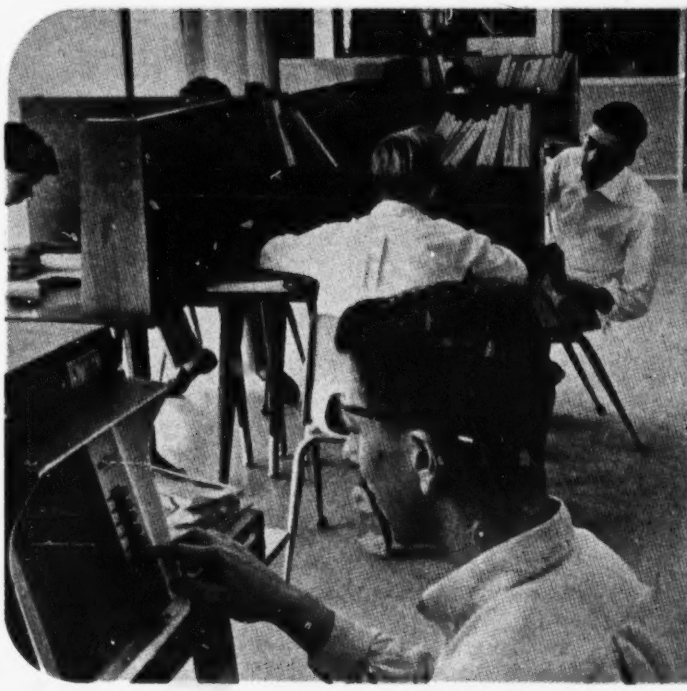
PREFACE

The Study Committee on Instructional Aids and Instructional Techniques was established by the Ontario Curriculum Institute to make a "survey of what has been done and what remains to be done; study of new aids and techniques plus new or greater use of old methods".[1]

During the months of April, May, and June, 1964 the seven members of the committee met every two weeks at Castle Frank High School or at the Education Centre for a luncheon meeting which usually extended well into the afternoon. This phase of the project was designed to provide an opportunity for committee members to probe and express their own feelings and to react to each other's ideas before the approach to the study was crystallized.

The second phase took the form of individual written work on an assigned topic during the summer vacation. This technique was adopted because prior commitments made it impossible to meet as a group, although each committee member thought it feasible to devote the equivalent of one week's work to the project during his holidays.

Starting on Saturday, September 26th, group meetings were resumed on a weekly all-day basis for a total of six sessions. Out of all this, plus a great deal of extra work done by committee members during the week, and additional meetings needed to



REFERENCE

1. Ontario Curriculum Institute, Revised Programme: First Three Years 1963-65, page 2

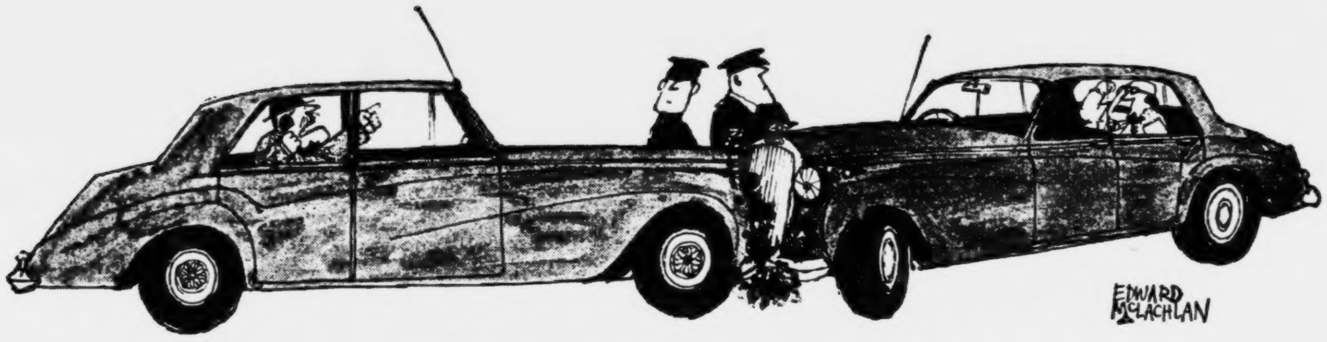
make final pre-printing decisions, has come this interim report.

The committee makes no apologies for the fact that the report is considerably less than a complete treatment of the assigned topic. To paraphrase an old witticism, "If we had been given more time, we could have made it even more incomplete."

Without the assistance of technology, the report could not have been made as complete as it is. Among the technological aids that were employed in its production are: a portable battery-operated tape recorder used for interviews and committee discussions; office copying equipment for the provision of multiple copies of printed, typed, and handwritten materials; photographic equipment; dictating and typing equipment; offset printing machines.

The physical form of the report has been chosen to emphasize the open-ended nature of the publication. For example, provision has been made to permit the insertion of additional information as it becomes available, as well as for the replacement of pages or sections which become outmoded. The existence of media of communication other than print is illustrated by the inclusion of disc recordings containing the oral contributions of two prominent persons, as well as slides and a filmstrip. The inevitability of revision is indicated by the adoption of "near-print", which employs electric typewriters and the acceptance of an unjustified right-hand margin in preference to the finality of printer' s type and justification.

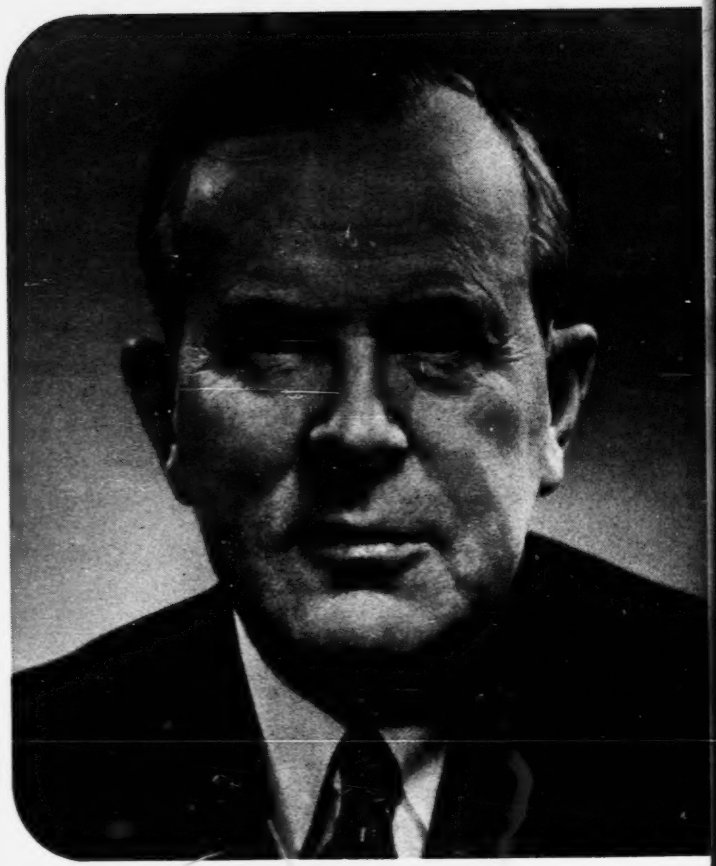
To sum up --- if the interim report, with all its shortcomings, impels the Ontario Curriculum Institute to continue its work in this important area, the committee will consider its efforts to have been worthwhile.


EDWARD McLACHLAN

OVERVIEW

EVIDENCES OF INTEREST AND CONCERN

The possibilities and implications inherent in large-scale use of technological developments in education are so staggering to the imagination that one can scarcely avoid coming into frequent contact with someone's opinions, well-founded or otherwise, as to the benefits or dangers of any widespread introduction of media into the formal learning situation. Suggested applications of technology range from the continued utilization of the book and the blackboard, to complete control of the learning programme of large numbers of students, by centrally-located computers.

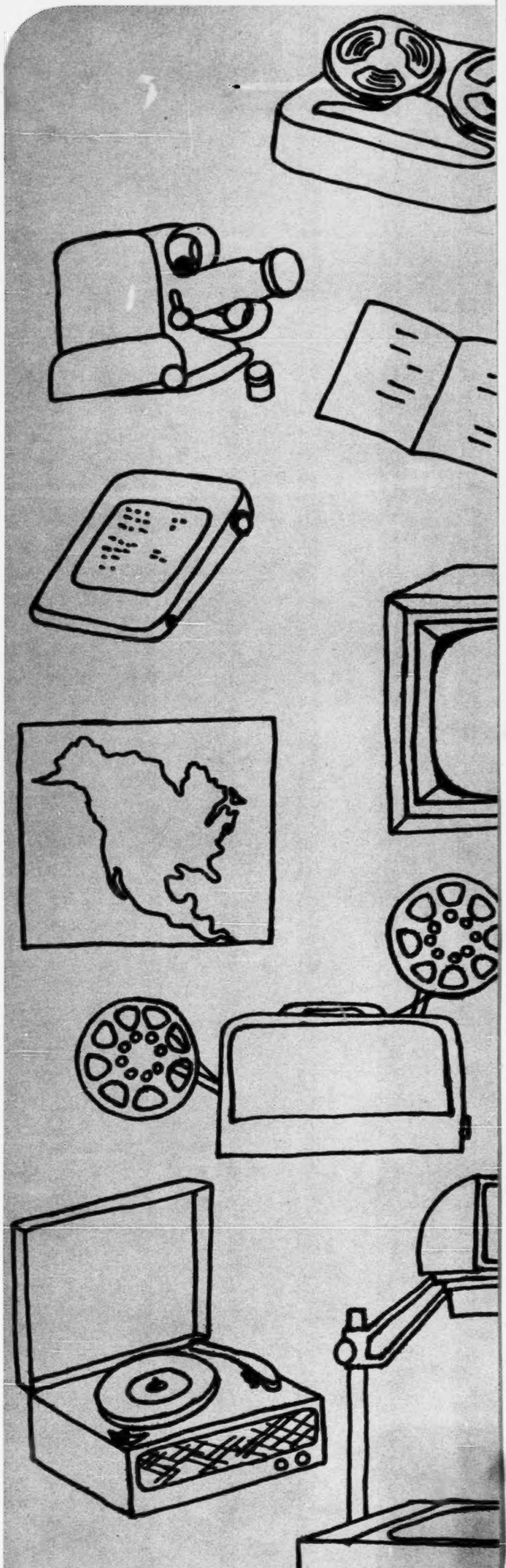


At the recent Third Commonwealth Education Conference, Prime Minister Pearson expressed a concern of many thoughtful persons when he warned that though the use of electronic media can become the most significant method ever devised for closing the educational gap, it could also become the most frightening of all the results of modern technology in its tendencies to dehumanize society.

In the recording which has been bound into this section, the Minister of Education for the Province of Ontario makes some interesting predictions regarding the introduction of the new technology into the schools.

✓ CHECKLIST OF LEARNING RESOURCES

- ☐ Aquarium & Terrarium
- ☐ Book
  - Bound
  - Looseleaf
- ☐ Booklet
  - Album
  - Clipping
  - Diary
  - Publicity
  - Scrapbook
- ☐ Bulletin Board
- ☐ Campaign
- ☐ Cartoon
- ☐ Catalogue
- ☐ Chalkboard
- ☐ Chart
- ☐ Club or Society
- ☐ Collection
- ☐ Competition
- ☐ Computer
- ☐ Costumed Figure
- ☐ Cut-Out
- ☐ Data Processing Equipment
- ☐ Demonstration
- ☐ Diagram
- ☐ Diorama
- ☐ Display Device
  - Animated Display
  - Display Board
    - Combination
    - Flannel
    - Magnetic
    - Peg
    - Plastic
    - Velcro
  - Easel
  - Showcase
  - Stand
- ☐ Dramatic Presentation
  - Costumed Play
  - Marionette
  - Mask
  - Miniature Stage
  - Pageant
  - Pantomime
  - Puppet
  - Radio Play
  - Role Playing
  - Shadow Play
  - Tableau
- ☐ Drill Device
  - Drill Card
  - Flash Card
- ☐ Duplicator
  - Blueprinting
  - Carbon Paper
  - Diazo
  - Gelatin
  - Glue Plate
  - Offset
  - Photographic
    - Contact
    - Optical
  - Rubber Stamp
  - Spirit
  - Stencil
  - Sensitized Matrix
  - True-to-Scale
  - Xerography
- ☐ Electrical-Mechanical Device
  - Electric Map
  - Electric Questioner
- ☐ Exhibit
- ☐ Experiment
- ☐ Exploded View
- ☐ Facsimile
- ☐ Feltboard
- ☐ Field Trip
  - Excursion
  - School Journey
- ☐ Filing System
- ☐ Filmstrip
  - Silent
  - Sound
- ☐ Game
- ☐ Globe
- ☐ Graph
- ☐ Information Storage & Retrieval System
- ☐ Kit
- ☐ Laboratory
- ☐ Lettering Device
  - Brush
  - Cut-Out
  - Embosograf
  - Felt Tip Pen
  - Guide
  - Hot Press
  - Mechanical System
  - Photographic System
  - Printed Alphabet
  - Rubber Stamp
  - Speedball Pen
  - Stencil
- ☐ Library
- ☐ Magazine
- ☐ Map
- ☐ Microfilm
- ☐ Mock-Up
- ☐ Model
- ☐ Motion Picture - 8 mm. & 16 mm.
  - Silent or Sound
    - Analytical
    - Animated
    - High Speed
    - Single Concept
    - Stop-Motion
    - Time Lapse
- ☐ Mould
- ☐ Museum
- ☐ Newspaper
- ☐ Notebook
- ☐ Object
- ☐ Optical Instrument
  - Binocular
  - Micro-Projector
  - Microscope
  - Telescope
- ☐ Pamphlet
- ☐ Photography
  - Still
  - Motion Picture
- ☐ Pictorial Card
- ☐ Picture
  - Drawing
  - Frieze
  - Mural
  - Painting
  - Photograph
  - Poster
  - Sketch
- ☐ Postage Stamp
- ☐ Presentation Device
  - Mechanical Writing Tablet
  - Presentation Unit
  - Status Board
- ☐ Printing Press
- ☐ Programmed Learning Device
- ☐ Projection Equipment
  - Projector
    - Cartridge Loading
    - Combination
    - Continuous
    - Filmstrip
  - ☐ Projector (continued)
    - Micro
    - Opaque
    - Overhead
    - Silent Film
    - Slide
    - Sound Film
    - Stereo
  - ☐ Screen
    - Front Projection
    - Multiple
    - Rear Projection
    - Wide
- ☐ Publication
  - Class Paper
  - School Paper
  - Yearbook
- ☐ Quotation
- ☐ Radio
- ☐ Realia
- ☐ Recording
  - Audio
    - Disc
    - Magnetic
      - Tape
      - Disc
  - Video
    - Kinescope
    - Kine Transfer
    - Magnetic
    - Thermoplastic
- ☐ Routine Device
  - Marking System
  - Response Indicator
  - Seating Plan
  - Visible Record System
- ☐ Sandtable
- ☐ Sign
- ☐ Silk Screen
- ☐ Slide
- ☐ Sound Equipment
  - Amplifier
  - Distribution System
    - Induction Loop
    - Oscillator
    - Wired
  - Headphones
  - Loudspeaker
  - Microphone
  - Radio
  - Record Player
  - School Sound System
  - Stereophonic Equipment
  - Tape Recorder
- ☐ Source Material
- ☐ Specimen
- ☐ Stereograph
  - Stereoscope
  - Telebinocular
- ☐ Storage Equipment
  - Modular Storage Units
- ☐ Study Carrel
- ☐ Tachistoscope
- ☐ Teacher
- ☐ Teacher Aide
- ☐ Team Teaching
- ☐ Telephone
- ☐ Television
  - Broadcast
  - Closed Circuit
- ☐ Test
- ☐ Textbook
- ☐ Toy
- ☐ Transparency
- ☐ Typewriter
- ☐ Workbook



THE COMMITTEE'S POINT OF VIEW

The committee feels that no potentially useful method, device, or system can or should be ignored in the hope that it will go away, and believes that the danger of dehumanization will not become serious as long as education is concerned with the learning process and not with the training and production of students to fit a mould.

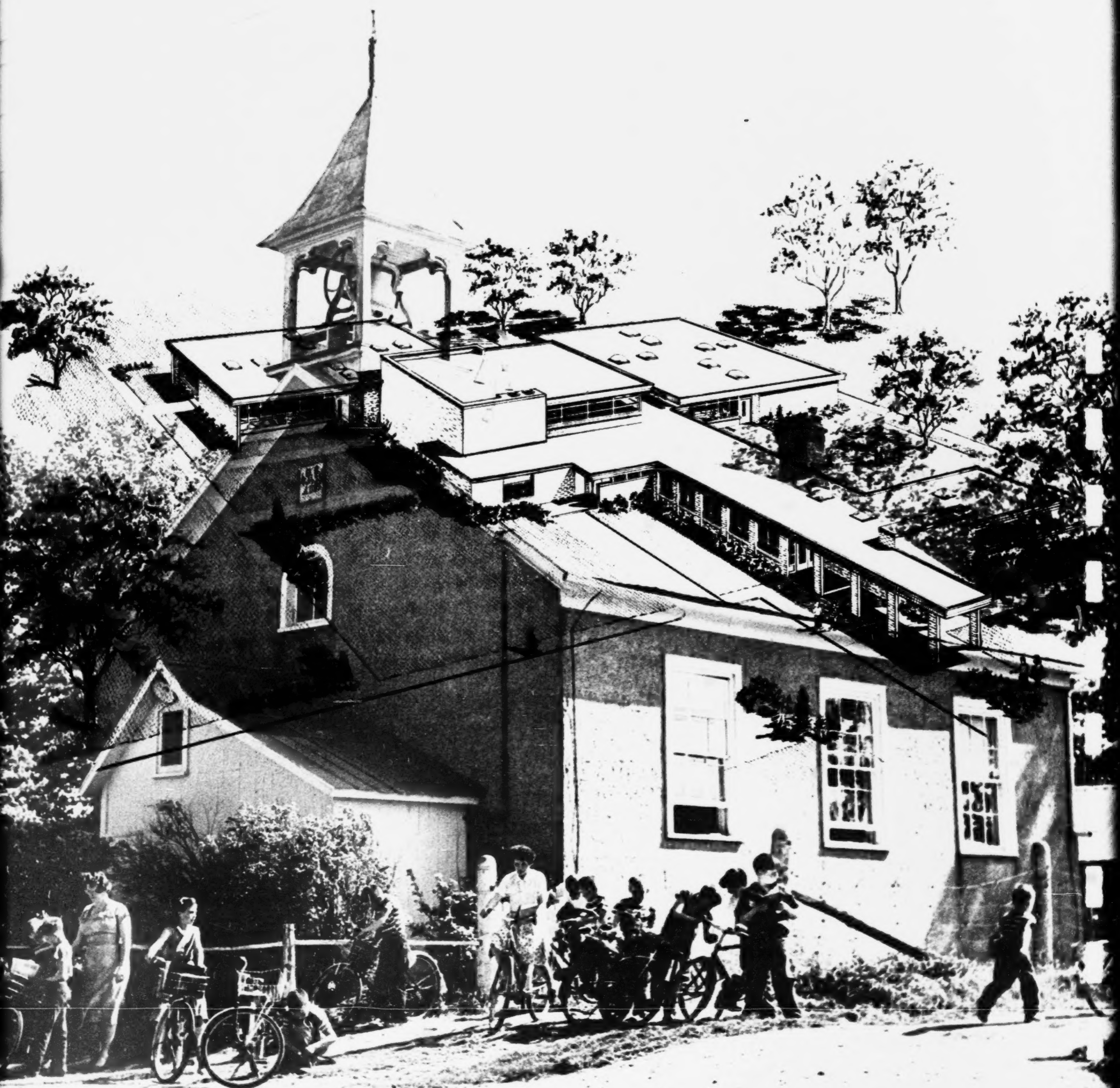
Consequently, a need is felt for a continuing programme of experimentation that will include not only such complex mechanisms as the computer, but also the scores of less dramatic though possibly more immediately useful devices that are included in the "Checklist of Learning Resources" which appears in this section of the report. At least the motto to be adopted by experimenters in the field of learning should not be "Surely there is a harder way of doing this!"

GENERAL CONCERNS

During the many hours spent in discussing various aspects of the committee' s assignment, several important matters of concern related to the serious use of technology in the learning process were identified. Among these are:

1. Although every thinking person pays lip service to the need for increased effectiveness in the field of learning, no one is sufficiently aroused about the critical nature of the present situation to mount a large-scale effort designed to meet the needs of to-day and tomorrow. We can face up to a serious situation in wartime and institute appropriate action — but not in a time of peace.

2. Despite the fact that all indications point to the absolute necessity of looking upon education as a continuum — something that requires the "cradle to the grave" kind of coverage, not enough is being done to co-ordinate the planning of those



in charge of the work, at various levels and in various regions.

3. Similarly, there is a deplorable lack of any concerted effort to conduct a planning and action programme at the national level. Research has been mentioned[1] as an area where this lack is particularly evident. The field of technology in learning presents a similar situation. The committee has had the temerity to recommend an extension of one aspect of its work to provide national coverage.

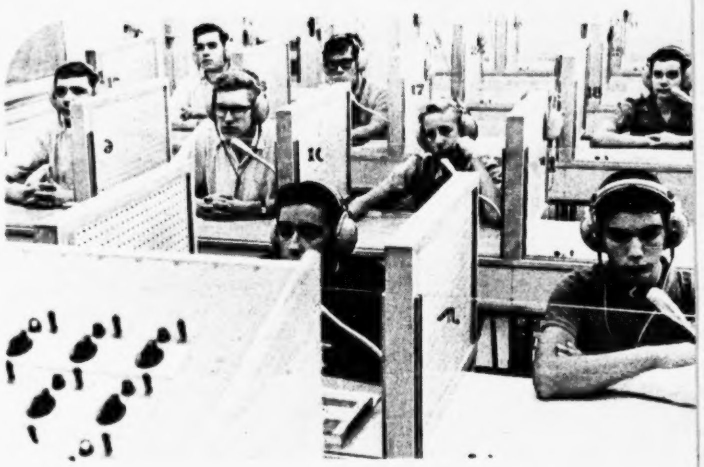
4. While there is a general acceptance of the fact that technology has some place in the schools of to-day and tomorrow, there is not sufficient realization that use of the machine can multiply the individual teacher's effectiveness. Happily, the adoption of some new techniques --- team teaching, for example --- makes the use of technology mandatory.

5. Educators, who should know better, and lay persons, who can hardly be expected to understand the complexity of a situation that involves working with thousands of developing minds, exhibit an almost pathetic belief that there will be developed some single method or device that will solve all the problems of mass education. It is the committee's belief that there always will be a need for a variety of methods and for a multiplicity of devices, unless one is aiming at a standardized product.

6. In some instances, lack of progress in the use of technology in schools is being rationalized on the basis of a need for modern building facilities. The committee feels it must point out that the most modern of methods can be initiated and carried on in old buildings, given a sincere desire on the part of teachers and administrators to increase the effectiveness of instructional techniques.

REFERENCE

[1] Address by J. A. Turner, Director of Education, Toronto Township, to the C. E. C. Convention, October, 1964



7. Many teachers profess to have no need for technological developments in their work, when, as is pointed out very clearly in a recent book[1] on the psychology of learning, the teacher himself is "an audio-visual aid of the first order". There is real cause for concern regarding the lack of awareness on the part of some teachers and supervisory personnel that carefully selected "teaching aids" are basic to effective learning, not merely a kind of peripheral gadgetry.

8. Perhaps most serious of all these concerns is the failure to put the emphasis on learning, rather than on teaching. It was suggested --- facetiously, we hasten to add, that the term "teacher" be superseded by the more realistic, albeit somewhat cumbersome, title "he-who-makes-it-possible-for-others-to-learn". The suggestion is put forward with no real expectation that it will be adopted!

SPECIFIC CONCERNS

The committee spent some time in a discussion of its concerns with respect to each participant in the learning process. For example:

1. The learner, whether child or adult, has a right to a "fair deal", and his problems and point of view must be given careful consideration when a system for effective learning is being devised. It is obvious that the learner learns in many situations, most of which are located outside the school. It may not be quite so obvious that some in-school situations actually inhibit learning. Anyone who doubts this statement should read the delightful --- and disturbing --- article entitled "The Poor Scholar's Soliloquy",[2] originally published in 1944, but just as pertinent now as it was twenty years ago. It has been charged that the schools of to-day are

REFERENCES

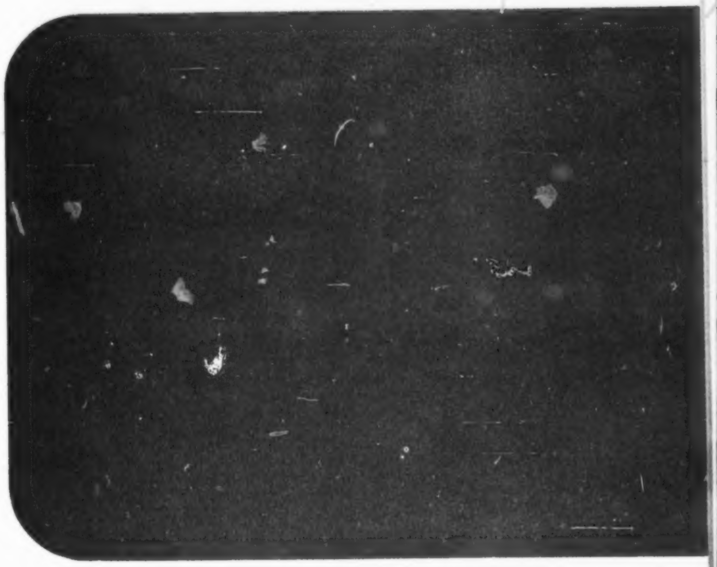
1. B.R. Bugelski, The Psychology of Learning Applied to Teaching, Bobbs-Merrill Company, 1964, chapter 11
2. Stephen M. Corey, "The Poor Scholar's Soliloquy", Childhood Education, January, 1944

in large measure set up on the basis of administrative convenience. If this system of operation is a factor which contributes to problems such as that of the drop-out, then clearly some improvement is needed. After all, no adult could stand up for long under a continuous feeling of failure, yet this is the daily experience of those pupils for whom the traditional grade system is not suited. Technology can help here by making possible a greater degree of flexibility in the organization of the learner' s school day.

By an intelligent combination of resources which can be marshalled right now, a repertoire of learning situations can be set up to enable each pupil to work in these settings:

a) in a class group of 30 or so - still a most useful procedure, despite assertions to the contrary from those who consider traditional classroom procedures to be outmoded. In this connection, there may be something of a moral in the following extract from a recent report on the college building of the future:[1]

> "One story making the rounds of faculty dining rooms, concerns the bright young instructor of 25 years hence who becomes appalled at the cost of equipping each student with an electronic carrel, each classroom with automated audio-visual systems, and each building with computers and color television receivers and transmitters. One evening, adding up all the costs and dividing them by the number of students at the college, a startling idea strikes the young teacher. The next morning he rushes in to see his dean and announces: "Look, instead of spending all this money on operable walls, revolving stages,



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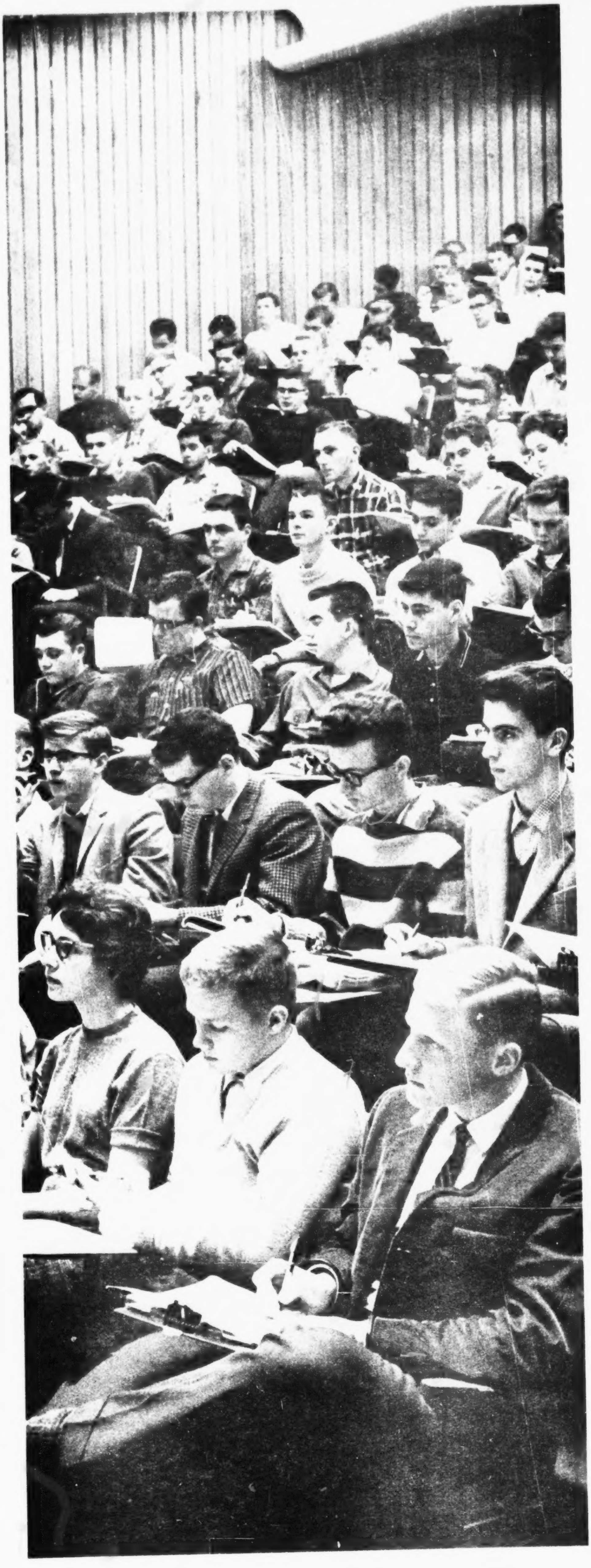
1. Mel Elfin in Bricks and Mortarboards, Educational Facilities Laboratories, 1964



coaxial cables, why don't we just divide up the student body into groups of 25 or 30 and put each group into a small room with a live Ph.D.? I don't know how the faculty will like the idea, but it's worth trying."

b) in smaller groups of any desired size - working under a group chairman; using books, duplicated materials of many kinds, recordings heard through headphones, audio-visual materials projected on small screens, etc.

c) in large groups - team teaching methods are being used to good advantage and are proving effective if backed up with adequate presentation facilities and followed up with small-group discussion.

... individually ...

d) individually - using programmed instructional materials, visual aids together with small individual viewers, recordings heard through headphones, etc. Ideally, this type of activity would be carried on in individual study carrels with equipment ranging from simple viewing and listening devices to the most sophisticated of systems employing an electronic screen and provision for calling up any desired information merely by dialling the required code number. Practically, the old-fashioned type of carrel called a pupil's desk will serve very well, especially if it is moveable and is moved!

e) individually with the teacher - thanks to modern technology, the teacher conceivably could organize the class work so time would be available for personal contact with individual pupils.

f) individually at home - it seems

inevitable that technological developments ultimately will provide visual and auditory materials at a cost low enough to permit their use as "take-home homework". Some school systems already make filmstrips and inexpensive plastic recordings available for use in the home.

There have been many plans devised in an attempt to provide at least some of the flexibility envisaged in the preceding suggestions --- the Winnetka Plan, the Dalton Plan, the Contract Method, to mention some examples from the 1920' s and the 1930' s. Of late much has been written and said about team teaching,[1] programmed instruction,[2] the Trump Plan,[3,4] and other developments that exhibit much promise. Implicit in all of these plans is the assumption that some part of the responsibility for learning should devolve upon the learner, and that the school is sensitive to his varied needs.

2. The teacher must become an administrator rather than remain a jack-of-all-trades. He must learn the difficult and painful technique of delegating increasing amounts of the learning process to others, while at the same time evaluating, guiding, counselling, and directing as needed. This delegation might take several forms, among them:

    a) to the pupil - small assignments at first, with frequent check-points established to ensure adequate follow-up on progress and direction regarding the next assignment.

    b) to machines - for presenting to individual pupils or to small groups, materials prepared by the teacher himself, by other teachers, or by commercial producers. Machine presentation can be effected by mechanical equipment such as

"ROLE OF TECHNOLOGY IN THE SCHOOLS"

On this recording the

MINISTER OF EDUCATION
HON. WILLIAM G. DAVIS

answers these questions:

1. What place do the new media have in schools?
2. What effect will the new media have on our present schools?
3. What impact will the new technology have on our organizational structure?
4. How should the schools be responding to the new technology?

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1. Medill Blair and Richard G. Woodward, Team Teaching in Action, Houghton Mifflin, 1964
2. G.D. Ofiesh and W.C. Meierhenry, editors, Trends in Programmed Instruction, Department of Audiovisual Instruction, N.E.A., 1964
3. David W. Beggs, III, Decatur-Lakeview High School, A Practical Application of the Trump Plan, Prentice-Hall, 1964
4. J. Lloyd Trump, Images of the Future, Commission on the Experimental Study of the Utilization of the Staff in the Secondary School, 1959

On some record players it may be necessary to put an ordinary rigid record on the turntable before placing the flexible disc in position.

goldfish

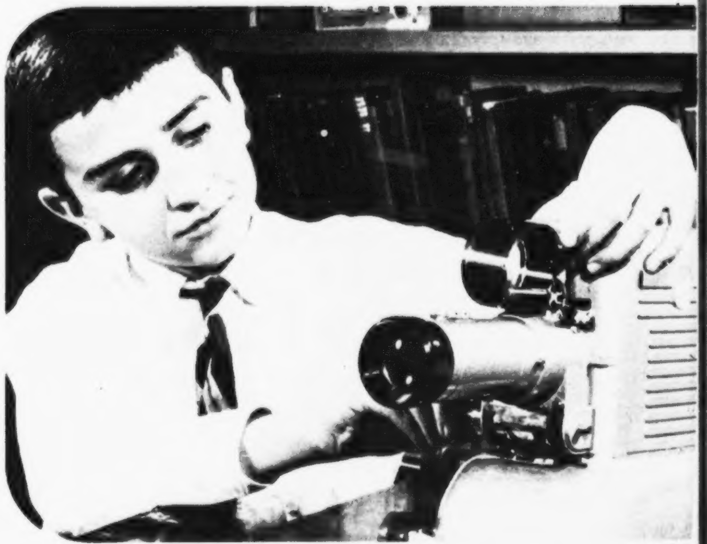
record players or tape recorders fitted with headphones; filmstrip and slide viewers; cartridge-type motion picture projectors, devices for the use of programmed instructional materials.

c) to other teachers physically present - team teaching, for example.

d) to other teachers actually removed in time or space, but called up via television, motion pictures, records, tapes, etc.

e) to teacher aides - clerical work, marking, preparation of graphic materials.

In other words, the teacher must assume an administrative role similar to that of the manager of a business department employing 20 or 30 persons. He must have the same clerical, stenographic, and secretarial assistance that the department head in a modern business establishment requires. He must be backed up with the technological equipment needed to conduct the business of learning, and he must have the authority to make decisions connected with the learning process as it applies to his classroom. Given these requisites, he must then accept complete responsibility even to the extent of denying himself the luxury of indulging in rationalizations such as:



> "I haven't time to use films (or TV, or filmstrips, or anything but talk)."
>
> "That TV programme didn't do a thing that I couldn't do." (But would he have done it?)

3. The school principal must give more than lip service to the cause of improving the learning processes in his school.

He, too, must become more of an administrator and less of a highly-paid clerk. He must become an educational leader, encouraging all evidences of a desire on the part of his staff to effect improvements in methodology. He must realize that one key to consistent use of instructional aids is ready availability of equipment and materials. He must make every effort to schedule each teacher's assignments so that there will be some opportunity during the day for preparation of work, for analysis of results, for planning. He, too, must forego the pleasure of indulging in such clichés as:

> "We already have a completely-equipped AV room."
>
> "Nobody uses the school's equipment without coming to me. I have it all locked up."
>
> "Filmstrips aren't of much value. Some of the ones in our school library are shown only once a year."

4. The school inspector must realize the effect of even the most casual comment. One inspector, who came into a classroom as the teacher was preparing to show a film said, "Don't take time to show that film now. I want to see you teach." Consider the inference that would be drawn by that teacher!

"He must become an EDUCATIONAL LEADER, encouraging all evidences of a desire on the part of his staff to effect improvements in methodology."

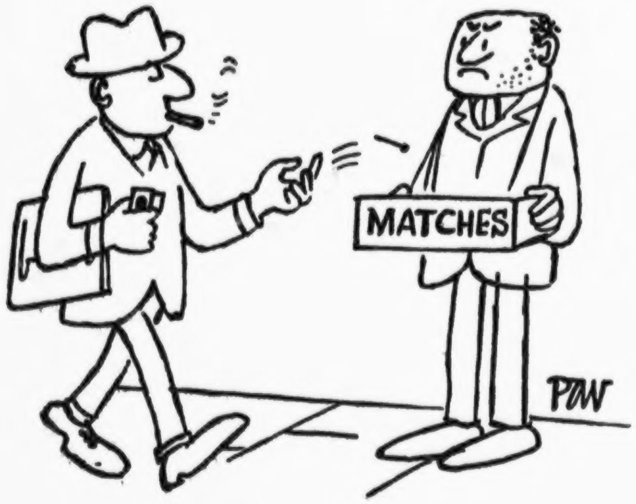
5. The chief administrative official in a school system must realize that his active support and evident approval are essential if any programme involving the use of technology in the schools is to succeed. He must reconcile himself to the fact that since he is dealing with hundreds or even thousands of human minds --- pupils, teachers, and administrative personnel --- it is most unlikely that any single simple solution to the problem of facilitating learning will be

found. Television will not be the complete answer; neither will programmed instruction, nor the most elaborate of computers. If he decides that the best attempt to work out a solution involves the provision to his teachers of a multiplicity of technological aids, he still cannot hope to discover one single simple method of utilization or even a single location within the school system to house the hardware. Some things will best be located at a central point; others can be kept in the school library; still others must be instantly available in the classroom; and undoubtedly some aids, filmstrips, recordings on inexpensive plastic discs, for example, will be used by the pupils in their own homes.

6. The school trustee must be aware of the contribution that can be made by technology, and must be prepared to stand up to the protests that will come his way from the public, who will belabour him no matter what he does but who in large part want the most efficient and effective methods to be adopted in the schools.

7. The Department of Education must take the lead in giving official sanction to the increased use of technology in the schools by encouraging the acquisition of approved equipment through grants to cover part of the costs involved, by increasing its support of the Audio-Visual Branch, and by extending the work presently being done in the training of teachers to use the various media as learning resources.

An interesting summary of some of the changes that are taking place in current thinking about the needs of the schools of to-day and tomorrow is presented on the opposite page. To effectively implement these developments, will require the full exploitation of technology in learning.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COMMUNICATION THEORY

Communication theories have at least two distinct roots that reflect the concerns of two differing groups of people. Engineers, with technical concerns, have developed models and theories that focus basically on equipment and its electrical and mechanical characteristics. In contrast, sociologists and psychologists appear to have been concerned with persuasion, propaganda and the moulding of public opinion. In neither group does there seem to have been any specific move to relate communication theory to education. It may be worthwhile to examine this fact before making a study of communication theories.

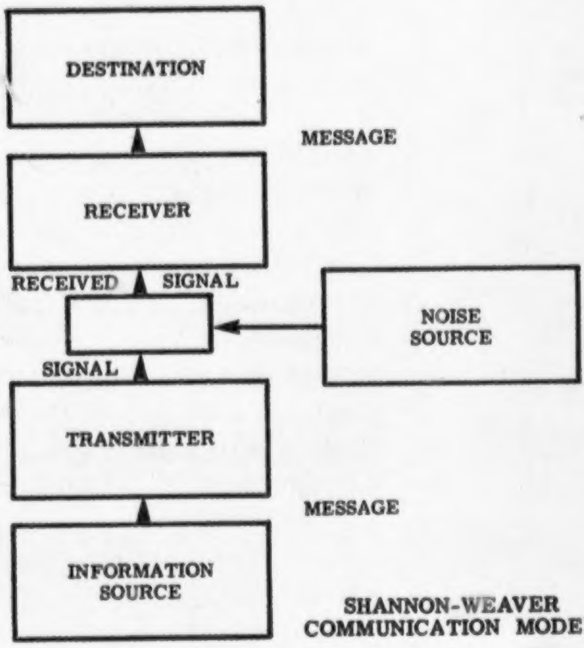
The theories of the engineers were based on the assumption that there was a message transmitted through a channel and their efforts were devoted to making the channel as perfect as possible so that there was no message distortion. This concept is of value only if education is to be viewed as a process through which messages are transmitted to a child. If this were accepted, the process of learning could be irrelevant! The theories of the sociologists and the psychologists dealing with persuasion, and so on, are not concerned with what a person "learns" but rather with what is necessary to get a person to act the way one wishes him to behave; for example, to have the person vote for a particular candidate or to buy a specific brand of bread. Furthermore, "persuasion" is far removed from "discovery" and from

providing for, and recognizing, the learner's insight and understanding.

Although examination of communication did not grow out of educational needs, the models and theories can be effectively used to provide insights. This is certainly true today when we have come to realize among other things, that:

- the school constitutes only a part, and a diminishing part, of an individual's total education;
- a person's broader environment shapes and contributes to his education to an important degree;
- many media of communication are major elements in the environment of today's youth;
- the school is seeking to improve and to increase its uses of many of these media;
- the learner's insights can be recognized and his needs provided for more effectively through a discovery approach rather than by persuasion.

Communication theories rooted in engineering are explained by selected examples. The Shannon-Weaver[1] work is probably best known for its introduction of the concept of "noise". Its authors considered the communication channel to be the source of problems, spurious noises (static), and distortions imposed by the frequency limits of the channel. For example, the telephone laboratories try to design equipment so that the receiver can accurately reproduce the words of the transmitter without any "interference". Deutschmann, Barrow and McMillan[2,3] used this theory as a basis for examining the efficiency of different media in the instructional process. They equated the "irrelevant" details of the classroom with "noise". These approaches carry the implication that "Daddy knows best", an implication also carried in the methods of programmed instruction. The teacher, communicator, or programmer, is an all-knowing creator who has determined exactly



SHANNON-WEAVER COMMUNICATION MODEL

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what is to be learned, no less, and no more.

Anything over and beyond what is desired is "noise"! This is much like the definition of a weed as a plant growing in a situation where it is not wanted. The above scepticism notwithstanding, it is most useful to be aware of the role of "noise".

It would seem that in many ways, Shannon and Weaver allowed their narrow and immediate concerns to confine the development of their theory. This, in turn, has limited many of those researchers who have attempted to start with the Shannon-Weaver model and to extend it.

The reader who wishes a clear statement of the type of studies and findings emerging for a contrasting school of thought should refer to the work of Abelson.[1] Abelson's concern is related to the way that opinions and attitudes are changed. Perhaps some issues raised earlier in this article should be reviewed. What role does the school see itself playing? Is the school an agency for indoctrination? Such questions, are, of course, one of the results of conducting part of the inquiry without direct reference to the presently stated goals of the schools, colleges and the universities. As Canadians we live in a country that has certain ethics and certain patterns of government. We call it a democratic society that bases its way of life on the Christian ideal. In practice we are often removed from those ideals. Are we to indoctrinate the pupil to a specific set of beliefs, or are we to develop the inquiring mind that will at some time question even those beliefs of his own parents? The choice, of course, is not clearly defined, for the beliefs of parents vary greatly; and if one set of beliefs were inculcated by the school, there would still be much questioning.

The reference for much of the research on opinion and attitude change was conducted out of a very simple model: who says what, to whom, with what effect? A brief review of the elements of this pattern will indicate some insights for education. The communicator is of course important. A statement if attributed to Churchill would be viewed and valued differently by an audience than the same statement if it were attributed to Marx.[2] Advertisers were aware of this when they dressed actors as doctors to read commercials that attempted to sell products in terms of their health values. We do not know what kind of figure a teacher is to his pupils. Are his statements given little or great weight by the pupils? It is reported that in some European countries a statement attributed to a professor is given more weight than is a statement attributed to a professor in this country.

It is rather obvious that the elements of the above-mentioned model interact. Thus when Rickover speaks about warfare, educators listen. When he speaks about education, they ignore him. Furthermore, each reader has certain areas of deep concern and certain areas of little or no concern. This is indeed the basis used for selecting that to which will be given attention. If UNICEF is a topic that holds little interest for an individual, it will be difficult to get him to attend to anything on this subject. Likewise, if a child shows little interest in spelling, he will also pay limited attention only, to matters on this topic. The "what is said" actually includes more than content and probably covers the widest range of variables. It concerns whether the message is conveyed in a threatening or pleasant framework. If the teacher threatens the pupil with grim, workless prospects, is it likely that he will attend better? This is not necessarily so.[3,4] The "what" in this framework includes the medium used, or as some theorists consider it, the channel. Our society does not attribute the same weight to a statement appearing in a newspaper as to one appearing in a book. In Egypt it appears that the radio is trusted far more than the newspaper. In addition to such matters as the receiver' s attitude to the medium, the medium has characteristics that must be respected and understood by the user. An advertising programme for newspapers must be modified before it can be televised effectively. A lesson from a textbook must be modified before it can be televised, or filmed, or broadcast, or recreated through models and experiments.

Educators are well aware that a successful lesson for one class in one part of a city representing certain cultural backgrounds, will not necessarily be successful in another part of the same city. Age, sex and background are among the factors that must be considered, whether we are considering learners or message receivers.

The question, "What effect does the message have?", highlights one of the characteristics of communication theory. It is conceived within a context of having some rather direct, observable consequences on behaviour. There is no possibility of examining the many deep and searching questions in this introductory report, but some of the places where fruitful inquiry might take place can be indicated. If all messages are to be measured in terms of effects, how do we measure educational messages? Surely retention, the common criterion, is the least relevant of the "effects" with which we should be concerned. For an excellent concise summary of many of the sociological issues implied, the reader is referred to Wright' s work.[5]

Having looked at two very broad approaches to "communication theory", there is yet a third that might be considered. There are persons who think in terms of media by using the word in its broadest sense. Thus, a painting, a person speaking, a television set, a model, a radio, money, architecture, a note written by hand, and a typed business letter, all represent various media.

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Dale[1] tried to consider media in hierarchies, ranking them in relation to their nearness to direct sensory experience with objects, or in terms of the extent of symbolic representation present in the medium.

While this provided an interesting stratagem for viewing media, it does not seem to have led to any further insights. It committed one serious folly in ignoring the fact that exposure to each and every medium was a direct experience with the medium itself.

Hartman[2] developed a case that considered communication in terms of the number of channels involved and the role of interference. His study[3] is especially worthy of note because of his very careful testing procedures. Again and again in the research, the reader is warned to note the number of times that a medium such as film, radio, field trip, model, television or even a lecture is evaluated in terms of print. Only that part of the experience which can be reproduced in print is capable of being tested. The test might actually be only of the student' s ability to generalize from one medium to another. The serious reader is directed to consider how much of a person' s learning is at the non-verbal level and then study Aldous Huxley' s examination of the same issue.[4] The reader is so trapped by his rubricizing[5] that he will find it difficult to deal with some of the restructuring that an understanding of media or communication theory will demand.

People have to learn to "read" all media. It is possible to be illiterate in the film medium, and so be unable to read film.[6,7] In addition to this it must be realized that all media have levels of difficulty. While readability formulas may ignore many aspects of "literature", they do indicate that various characteristics of the medium, regardless of content per se, make it, more or less, difficult to read.[8] The same thing has been shown to hold in a child' s viewing of pictures.[9] To emphasize further the importance of the non-verbal learning, there is evidence to indicate that asking people to verbalize non-verbal concepts which they have learned, can "destroy" the learned concept.[10] The continual use of the medium of print for testing and evaluating learning in other media may not only be bad testing, but may also destroy or distort some of the non-verbal concepts that had been correctly learned.

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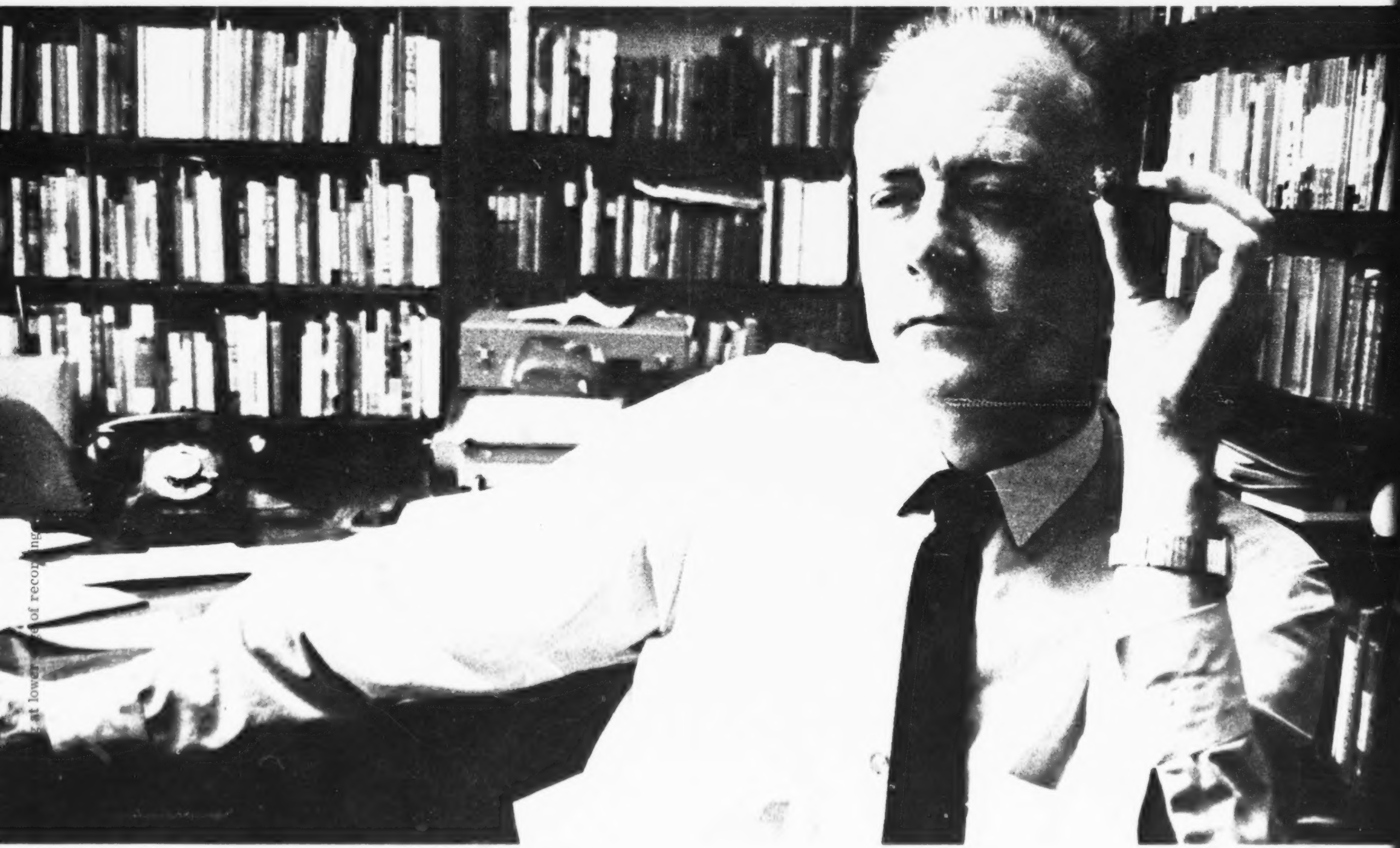
"Children have the utmost difficulty adjusting to the old 19th century technology which we call our school system. The teacher has no difficulty, because he or she was brought up in that technology and trained in it, and is still living in it in the classroom. But any children certainly from the age say fifteen downwards, have no relation, no means of establishing contact with curriculum or classroom."

"We have on our hands the largest obsolete school system in the world --- that is, North America has. I don't think this is a very amusing situation. Really it is a terrible waste, not only of money and time, but it is so confusing and frustrating to children and teacher and parents alike."

from a discussion with
PROFESSOR H. MARSHALL McLUHAN
November, 1964

Remove recording by lifting here.

To talk about media of communication and communication theories without talking about McLuhan, would be incomplete. Professor McLuhan expresses some of his ideas on the following disc recording.



Replace recording by depressing tabs between plastic

REFERENCE

1. M. McLuhan, Understanding Media: The Extensions of Man, New York: McGraw-Hill, 1964

He states that the medium itself is a potent force affecting the ways persons organize and perceive the events in the world about them.[1]

On some record players it may be necessary to put an ordinary rigid record on the turntable before placing the flexible disc in position.

MECHANICAL TECHNOLOGY GIVES WAY TO ELECTRONIC

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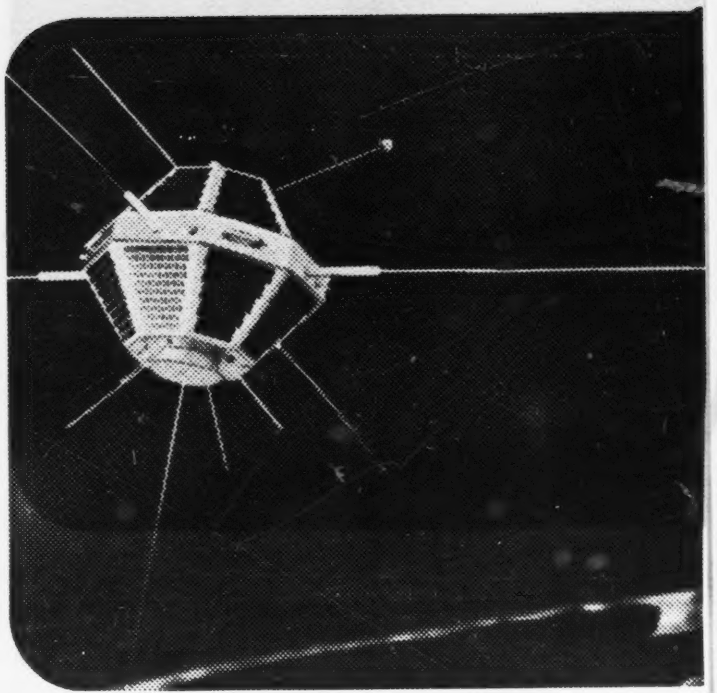

The unique, linear, line at a time, characteristics of print, McLuhan identifies as being synonymous with our great technological progress, our assembly line and mass production techniques, as well as with ways of organizing information that are incompatible with the electronic age. In essence, the electronic age makes it possible for man to reach out, across and around the world in all directions, completely ignoring time and space and their dimensions. If print is one dimensional following a line, then television is omnidimensional and at once swallowing all lines into patterns.

It is McLuhan' s contention that present curricula and instructional programmes are organized according to modes of thought shaped by our powerful, and, in the past, fruitful print technology. The child of today is moving into a world where such modes of organization seem no longer appropriate.[1] As the child watches the television screen and receives the continuing bombardment of data through all his senses, he no longer attempts to line things up. Rather, he attempts to deal in gestalts or in patterns. From the fast-paced existence of his world, the child moves to a school with its plodding, slow, point-after-point pace. He can hardly restrain himself. It is possibly true that the accumulating of information must proceed by the assumption of one piece of information at a time. However in this sequential manner, interacting patterns of data are hard or almost impossible to perceive. The child is used to dealing with the patterns of television rather than the isolated, fragmented data of the textbook, and it behooves the school to organize and present a curriculum which matches the child' s thought modes and patterns.

There are now several lines of independent inquiry being reported that may indeed not only substantiate McLuhan' s thesis but also provide examples for the school to follow in restructuring their curricula. For example, Otto[2] indicates that the verbal orientation of the subject is a critical variable to consider when confronting the child with pictorial material. The reader is, however, warned to be constantly alert to most researchers' print biases which frequently result in a design that will reinforce this bias. This is apparent in Ketcham and Heath' s examination of films in which they did not present the visual content directly![3]

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1. M. McLuhan, We Need a New Picture of Knowledge, New Insights and the Curriculum. Washington: Assoc. for Supervision and Curriculum Development, 1963, 57-70
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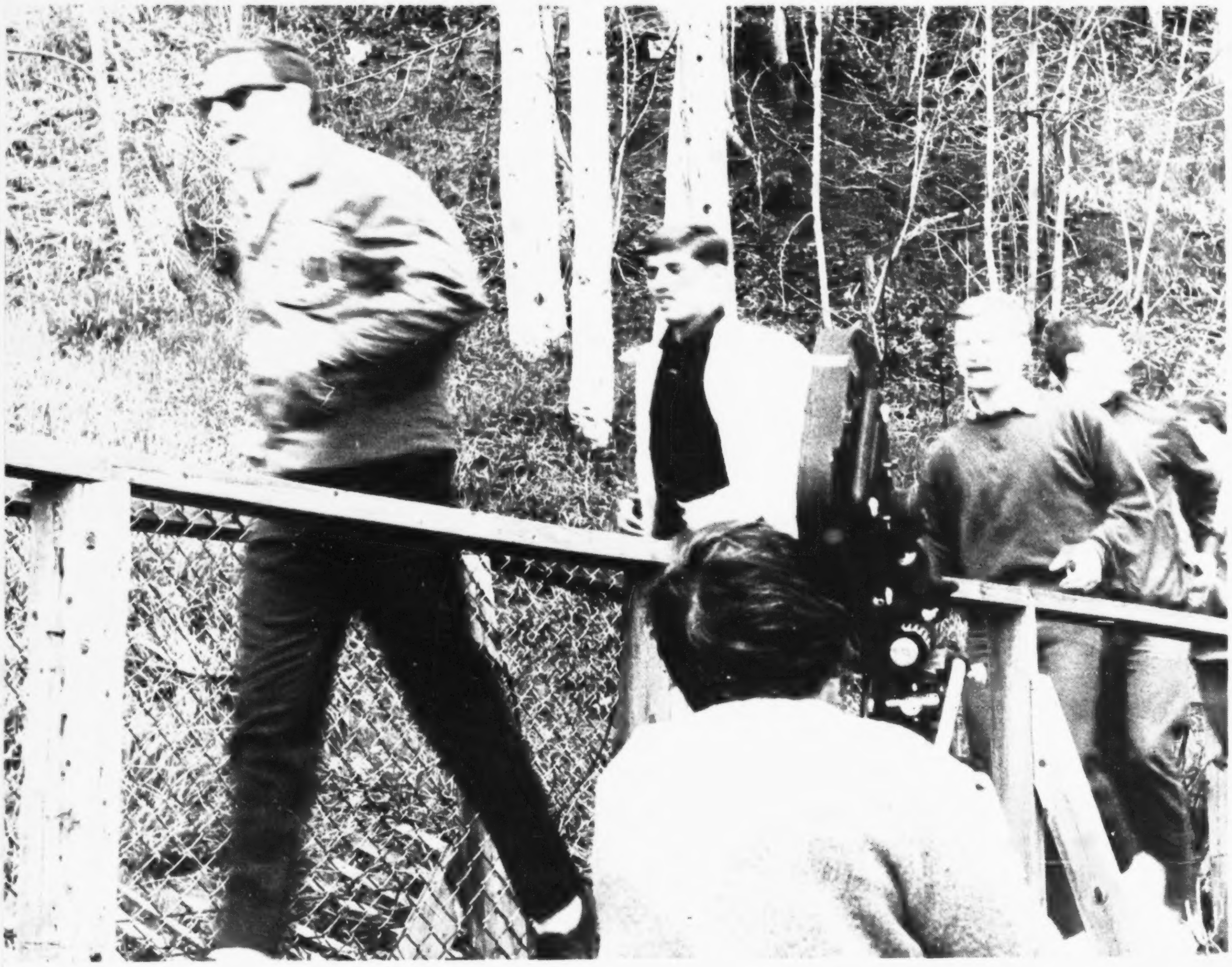
3. C.H. Ketcham, & R.W. Heath, Films without Direct Visual Presentation of Content, Presented at Am. Ed. Res. Assoc., February, 1963, mimeo



... becoming literate in the film medium,
these students scripted, acted, and
produced their own motion picture

If a medium is a totality then it distorts the medium completely to remove, or "butcher", one of its channels. The researchers' evidence seemed to bear this out, although they depended almost entirely on the aural content of the films for their examination. Of course, the question of whether or not the media are properly used in education can be raised again at this point. Evidence supplied by Tanner and Woerdehoff[1] shows that, in some cases, the medium's potential is completely ignored.

Before examining administrative details of storage and distribution; before looking at technical specifications, maintenance and cost; before deciding who will be responsible for running the machines and distributing materials; before trying to select from the materials that have been produced; before discussing the problems of material production - the costs, royalties, unions, commercial vs. teacher-made and residual rights; before all this, the basic issues of the media themselves must be examined. Literate though we may be in print, we are illiterates in the other media, and until we are literate in most media we cannot properly understand their place in the educational process.

McLuhan has succinctly detailed some of the issues:[2]

> "Educators ... protected by bureaucratic structures ... know less about the new media ... because their decisions are not based on immediate contemporary pressures, nor are their wrong decisions tested every few months on the adequacy of their students to cope with a new world."
>
> "The new media bring new educational objectives."
>
> "The adult world today is simple. The child world is sophisticated ... the only strategy is to involve the young far more in the teaching-learning process than formerly. This can be done especially well in teaching the languages of the media, for the children know these much better than the teacher."

The media must be seriously examined if the "institutions of schooling" --- and this includes the

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1. D. Tanner & F.J. Woerdehoff, Profiles of Instructional Methodology for Selected Television Courses, School Review, 1964 pages 72, 201-208
2. M. McLuhan, Understanding Media, Washington: U.S. Office of Education, 1959, mimeo

"The objectives of the new media have tended, fatally, to be set in terms of the parameters and frames of older media."

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NAMING OF PARTS

To-day we have naming of parts. Yesterday,
We had daily cleaning. And to-morrow morning,
We shall have what to do after firing. But to-day,
To-day we have naming of parts. Japonica
Glistens like coral in all of the neighbouring gardens,
And to-day we have naming of parts.

This is the lower sling swivel. And this
Is the upper sling swivel, whose use you will see,
When you are given your slings. And this is the
piling swivel,
Which in your case you have not got. The branches
Hold in the gardens their silent, eloquent gestures,
Which in our case we have not got.

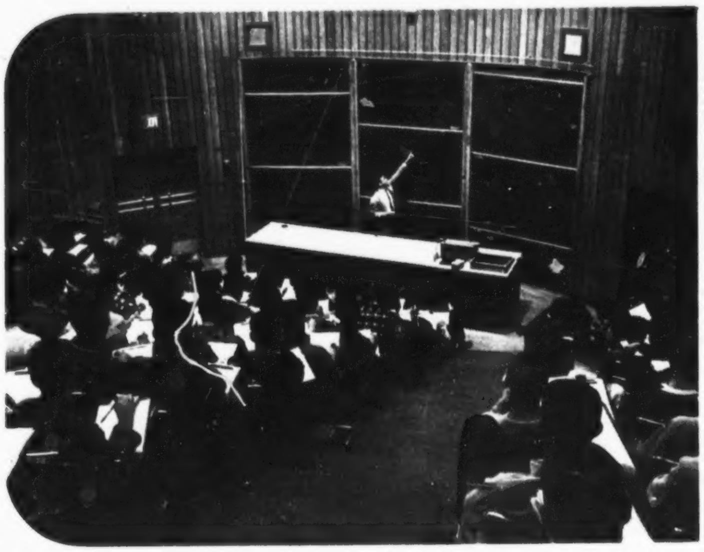
This is the safety-catch, which is always released
With an easy flick of the thumb. And please do not let me
See anyone using his finger. You can do it quite easy
If you have any strength in your thumb. The blossoms
Are fragile and motionless, never letting anyone see
Any of them using their finger.

And this you can see is the bolt. The purpose of this
Is to open the breech, as you see. We can slide it
Rapidly backwards and forwards: we call this
Easing the spring. And rapidly backwards and forwards
The early bees are assaulting and fumbling the flowers:
They call it easing the Spring.

They call it easing the Spring: it is perfectly easy
If you have any strength in your thumb: like the bolt,
And the breech, and the cocking-piece, and the point of
balance,
Which in our case we have not got; and the almond-
blossom
Silent in all of the gardens and the bees going back-
wards and forwards,
For to-day we have naming of parts.

excerpted from Henry Reed's
"Lessons of the War"

universities --- are to be, in the future, "institutions of learning". Such an examination is most difficult for "the objectives of new media have tended, fatally, to be set in terms of the parameters and frames of older media".



INDONESIA

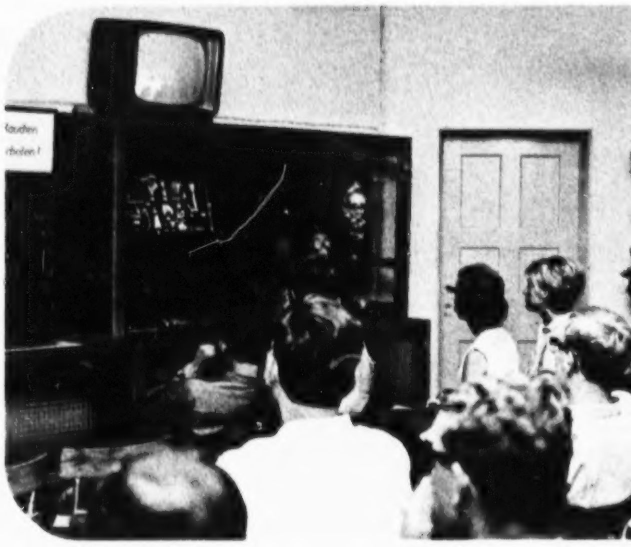
USE OF MEDIA IN EDUCATION : WORLD DEVELOPMENTS

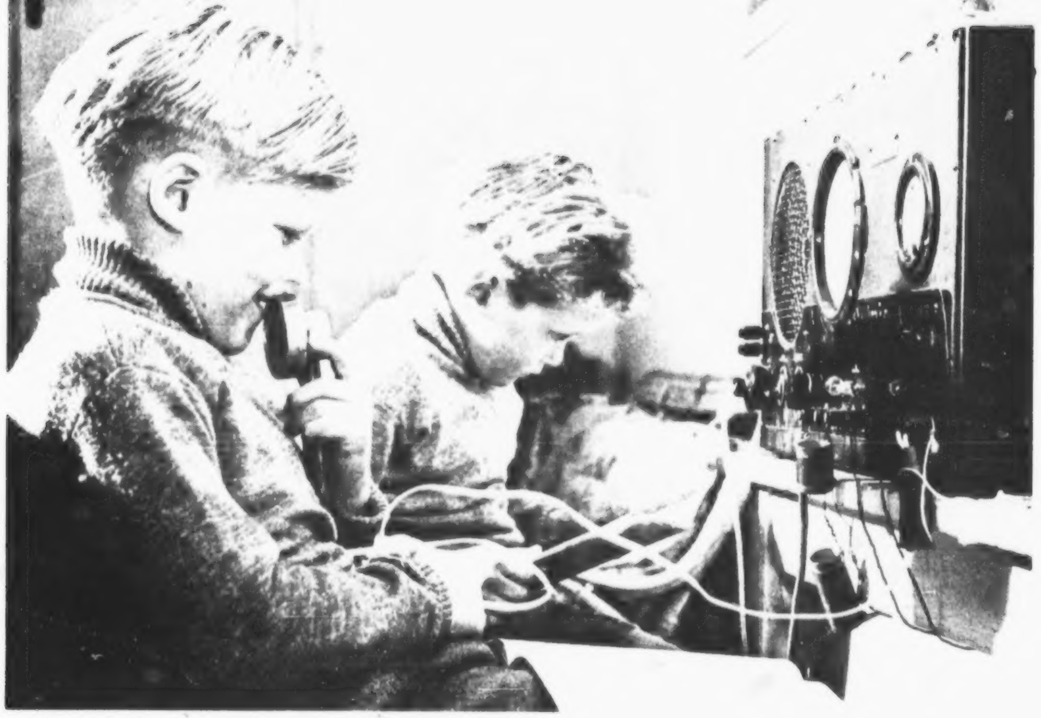
When the wind blows across the desert and through the village of Abdelaka, school closes. How can the teacher teach and the students study when the sand begins to shift? For in this and countless other communities in the dry underdeveloped countries, school is held outdoors with the sand providing a "blackboard" and "workbooks".

In the classroom of a large primary school in Bonn, West Germany, the projection screen is darkened as a bulb burns out from continued use. For a brief moment as it is replaced, formal education stops. Then the machine is started again and the murmur of pupils gives way to sounds and pictures of earth satellites in orbit.

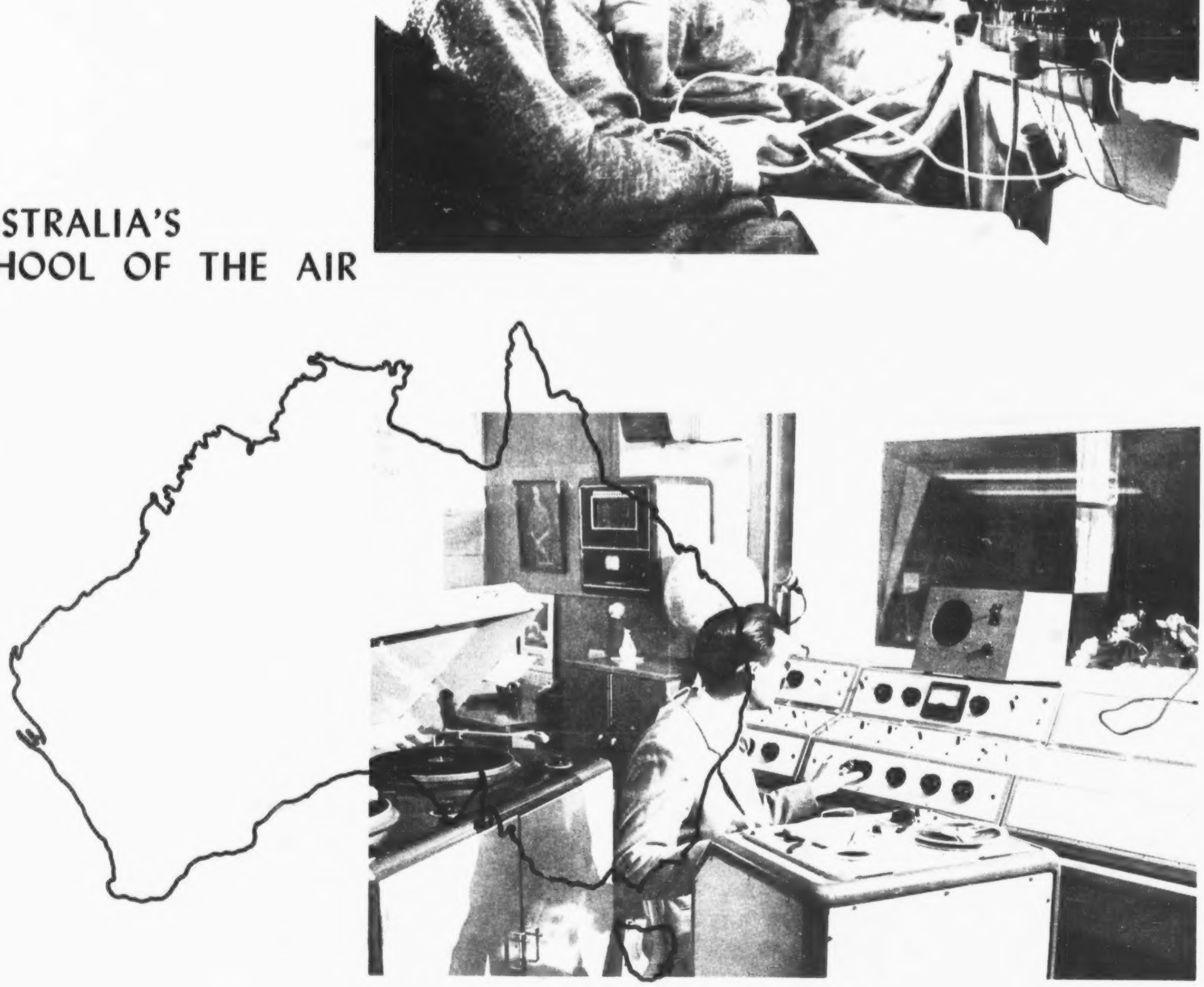
Around the world, the stage of technology and the needs of each society are being reflected in its methods of teaching. But innovations are coming quickly to every culture. Current world developments in the use of media for formal education make a fascinating story.

Australia' s Schools of the Air have become a legend. Started some fourteen years ago as a means of enhancing correspondence schooling in the outback of that vast continent, they are firmly established in each of the six states. At ten o' clock each morning the theme music fades and the principal teacher welcomes her students for another day. Through the studio loudspeaker comes back the





AUSTRALIA'S SCHOOL OF THE AIR

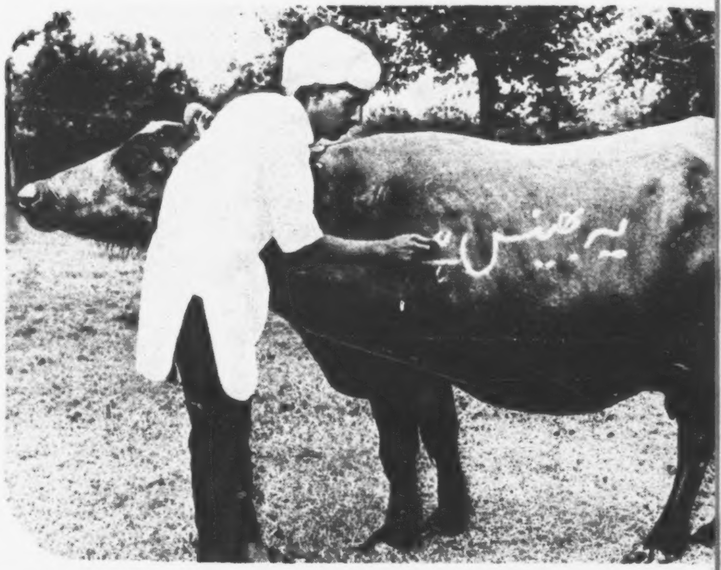


eager response of the children, seated before their two-way radios. Together radio teacher and pupils from widely dispersed farmsteads join in song, consider current events, review their arithmetic problems, and discuss their written correspondence work. The staffs of the radio schools work closely with the State correspondence schools to achieve a remarkable degree of personalized attention. Graduates of this schooling have proceeded to become teachers, doctors, writers, and ministers. However, the greatest accomplishment of the service is perhaps the personal social growth of its pupils. Seated before their transceivers in farm kitchens and living rooms, children hundreds of miles apart can use the short wave network of the Royal Flying Doctor Service to share the joys and difficulties of youth. With the stimulation and guidance of their teachers, youngsters gain new insights which reach far beyond their station, and they settle problems which would take weeks to resolve by mail.

The picture above shows Colombo Plan trainees from Indonesia studying audio-visual methods at a municipal centre in Ontario. Little of this type of international assistance has been undertaken.

Many nations today have suddenly become aware of their deficiencies in the use of modern technology. No longer content to be deprived of material well-being, they struggle to reach far off goals amidst social and political unrest. Are they invoking the very technology they seek?

Indonesia is no exception. Delivered into the world slowly and painfully after the Second World War it immediately threw its resources into education. Before the fighting had stopped in the streets of Djakarta, the new nation's provisional government had established a new university and declared its intent to pursue universal education. Realizing the urgent need for effective teaching methods and left with a legacy of late nineteenth century European education, the government moved quickly. With the help of UNESCO and Canadian audio-visual education experts, a national teaching aids centre was opened at Bandung. There followed the establishment of film studios and a radio network. Now, the national centre is decentralizing to regional quarters in each of the nineteen provinces. Western techniques have been adapted to the many local cultures and environmental conditions within the country. Much emphasis is given to methods which employ non-projected materials. Even the traditional Wayang puppets which portray in many forms the struggle between good and evil,



have made their contribution to formal education. Courses in the use of puppetry, the preparation of feltboards and charts, the production of filmstrips photographically and mechanically, and the pedagogy of film in the classroom are just part of the work of the teaching aids centres. And now television is to play its part - not in the didactic manner so common in the West, but in the culturally rich way of the Wayang, which binds the everyday experiences of life, with the Academy.

The need for focal points of service, production, and training in the use of instructional media has led to the establishment of teaching aids or audio-visual education centres in most parts of the world.

The Czechoslovakian national teaching aids centre opened in March 1963, in a former movie theatre which had perhaps fallen victim to the inroads of television. The remodelled premises, situated on a main street in Prague, afford display space, lecture and demonstration rooms, a small library, administrative offices and a hundred-seat theatre. The centre publishes a magazine for teachers, advises on the production of school films and produces filmstrips. To this busy place come teachers intent on examining displays of educational toys, teacher-made science equipment, a specimen language laboratory, and a variety of other learning materials. In the hopes of encouraging more effective teaching, the centre is to become associated with the hundred media libraries which exist throughout the country. Topical kits of various teaching materials are being prepared to stimulate what the Americans call the "multi-media" approach. While the centre itself does none of the technical work, which is left to existing specialized agencies, it is rapidly becoming a stimulating and creative force in Czech education.

A major impetus to the search for new teaching techniques has been the world-wide shortage of qualified teachers and the demands for quality instruction which the new knowledge makes upon teacher training institutions. The use of television and videotape to enable student teachers to observe experienced teachers in action has met with success in the United States and in the United Kingdom. Last fall, the idea was implemented in Canada.

Students in the Faculty of Education at the University of Alberta are being confronted with the realism of unedited videotapes, televised in the McKernan Public School in Edmonton. Previously, students had visited classrooms to observe at first hand. Apart from the obviously artificial situation which this engenders, it has other failings which are being overcome through televised observation. It is possible now to observe through the medium of tape, lessons which illustrate especially well, appropriate topics such as motivation of student interest, handling classroom discipline problems, or presentation of difficult concepts. The benefits of this system accrue not only to the student teacher, but also to the practice teacher, the public school pupil and the education faculty member. For example, individual pupils are brought to the university for clinical work in reading, speech, guidance, and psychological counselling. The process when recorded through the eye and ear of television becomes invaluable for diagnosis, research and instruction as well as for its benefits to the student. Based on the success of the programme to date, plans for an extension of the project are already being discussed.

Broadcast television, too, is finding its place in the formal education of the world's people. While the most spectacular developments have occurred in the United States and Japan, Italy has met with great success with Telescuola (television school).

In 1960 the Italian television system commenced a series to teach illiterate adults to read. The response to these programmes was overwhelming, and additional basic education courses in history, geography, the sciences and the arts were produced. It is interesting to note that proposals put forth by U.S. educators for a literacy campaign in "Appalachia", include proposals similar to Telescuola. Telecasts from Rome have also played a basic role in the remarkable technical education programme which has been offered to Italians during the past six years. Students, high in the Apennines or scattered through rural Calabria, who have been deprived of any post-primary education because of their remote locations, are now able to complete a regular vocational school course. Daily telecasts are supplemented by seminars conducted by visiting teachers.

Although the mastery of a first language is basic, second language instruction has become of almost equal importance in many countries. The use of the tape recorder in language laboratories was pioneered by the U.S. military under the stress of the Korean war. It is surprising now to find that island of the English language, Great Britain, a leader in the application of language laboratories in the schools.

By the autumn of 1963 there were well over a hundred language laboratories in use in Great Britain. These ranged from an experimental unit with three places, at the Hull Institute of Education, to an established installation, which boasted three twenty-one place labs, at a commercial school in Glasgow! While all the labs are using material which they have prepared themselves, many of them are also trying out commercial courses such as "Voix et Images". British educators hold high hopes that programmed instructional techniques will be developed to the point of becoming useful in language instruction, and research is being conducted at several universities. The cheap, flexible vinyl disc recording is being used in at least one series of commercial language courses developed

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Primary students in a Japanese school view a telecast

Director and staff member of the University of Alberta's Audio-visual Media Centre operate controls of mobile television unit for teacher training

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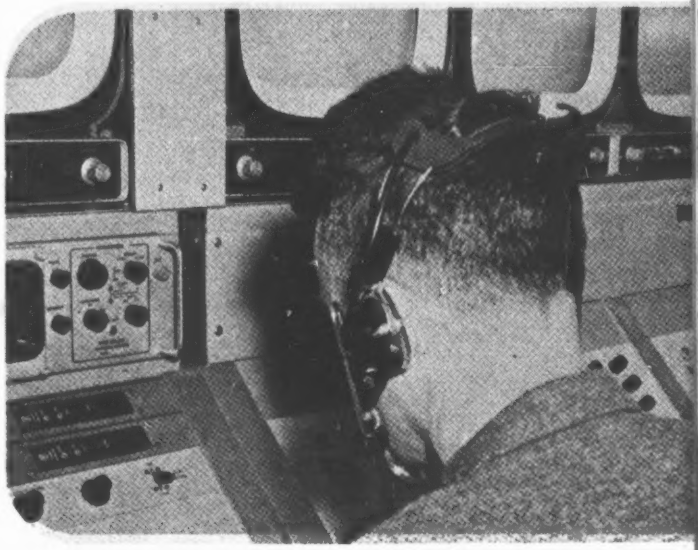
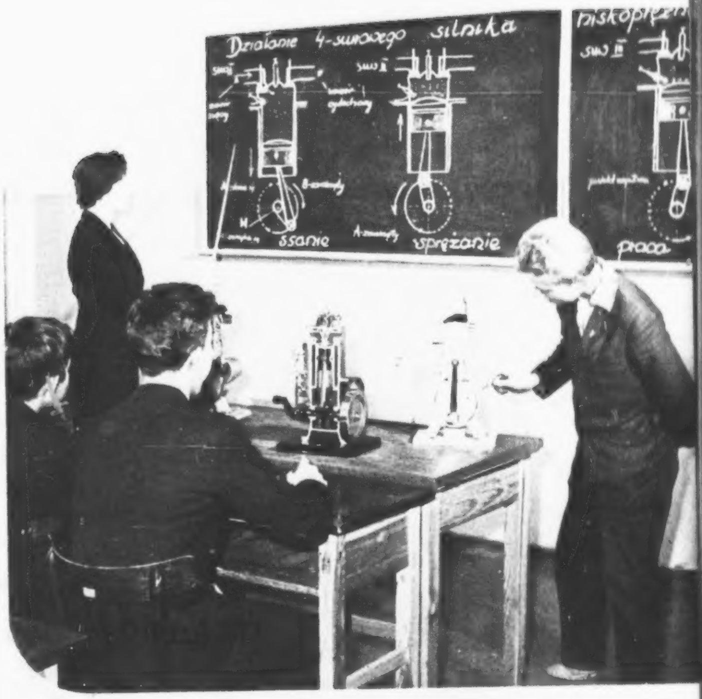


JAPANESE SCHOOLS WITH T.V. SETS (July, 1963)

Kindergarten	5,760	(77%)
Nursery	5,990	(57%)
Primary	23,880	(90%)
Middle	10,440	(82%)
High	2,440	(69%)
Night High	1,230	(50%)
Total	49,740	(81%)

Japanese children participate in the production of school telecasts

in Britain. In fact, all of the media are being exploited by British educators to cope with the growing realization that fluency in the native tongue is not enough.



Japan has passed through a revolution in education as in social customs. With an electronics industry which is firmly embedded in the fibre of its national life, it is not surprising that the Japanese have adopted instructional technology as avidly as they have appropriated baseball. Television and radio sets are in abundant supply in the schools and the NHK has full schedules of classroom programmes. Motion picture films, slides and tape recordings are extensively used and there is a wide range of nationally-produced equipment. With the passing of the old authoritarian ways of teaching, instructional materials are generally used in a permissive atmosphere for exploration and discovery. Japan' s inventive genius and high interest in schooling promise to make this country a leader in the use of educational technology.

The progress of education in South America is not so encouraging. An outstanding effort is being made in Colombia, a country where half the population is illiterate and where the teachers have an average of grade five education. The Ministry of Education, with the help of Peace Corps volunteers and U. S. funds, began telecasting to schools in March, 1964. The first programmes carried by the government broadcasting network were for teacher training. Now on the air are primary mathematics, social studies, natural science, and language telecasts. Along with the large-scale installation of receivers went utilization training courses and supplementary printed material. While it is yet too soon to assess the effects of this project, there is little doubt that it is making a substantial impact. If it is considered to be successful, it may have an electrifying effect on the role and activities of Peace Corps members around the world. The introduction of the instructional technology of the twentieth century may become one of their major preoccupations.

Examples of the use of media in education throughout the world are legion. The 1962 Paris UNESCO conference of experts in the use of new media in education recognized[1] that substantial

REFERENCE

1. New Methods and Techniques in Education, UNESCO, 1962

MAURITANIA

In Mauritania, a region bordering on the Sahara, many of the population are nomads, moving from place to place to find grazing lands for their herds. Children of the nomad families have some opportunities for schooling in tent classrooms, like the one in this photograph, but their chances for much progress are of course reduced by their wandering life.

With camels to carry themselves and their equipment, teachers of the nomad schools cover immense stretches of the desert each year as they move from camp to camp.

a un joli
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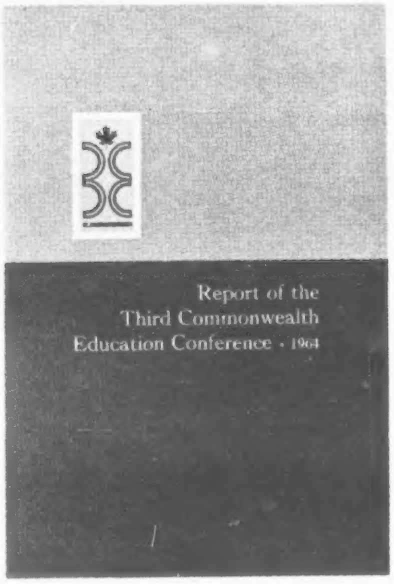
la figure

developments were being made, but urged specific action lest rapidly growing needs outstrip progress. The conference recommended demonstration centres, research and development projects, training plans, and proposals for international co-operation in technical affairs and exchange of information.

Again, at the 1964 Commonwealth Education Conference meeting in Ottawa, use of instructional media was a main topic of discussion. The desire of developing countries to embrace the new technology was expressed by the Indian Education Minister, Mr. Chagla, when he called on more advanced Commonwealth countries to provide the needed equipment.



Report of the
Third Commonwealth
Education Conference · 1964

Around the globe, both progress and need are apparent. A UNESCO survey of the expressed needs of African countries in 1962 reveals time after time the desire for instructional media: Basutoland - blackboards, wall maps, cine projectors, filmstrip projectors; Bechuanaland - film projector and basic teaching aids; Burundi - teaching aids and equipment for science teaching; Dahomey - audio-visual equipment, filmstrip projectors, slides, tape recorders, simple cameras ...... and on and on to Upper Volta with its request for battery-operated slide viewers, slides, and transistor radios. The continued expansion of instructional technology in every country of the world is apparent. That this will develop intelligently with international co-operation, until it becomes "environmental", in the words of McLuhan, is indeed desirable. For if not, the youth of the world, immersed in modern culture, will reject that irrelevant and stodgy museum-piece, the school of yesterday.

Bonn,
GERMANY

Toronto,
CANADA

USE OF MEDIA IN EDUCATION : ONTARIO

The need for a significant study of the use of media in the schools of our Province is certain. Existing statistics are of limited value in forming an intelligent appraisal of the situation. Through interview, reading, and discussion based on personal experience, the Committee has formed some impressions of what is, and perhaps of greater importance, what is not happening with learning resources in Ontario schools.

The informed layman is apt to assume that modern media have become an accepted part of the school environment. Newspapers give prominent display to reports of technology in instruction. The press carried full accounts of speeches from the 1964 Commonwealth Education Conference in Ottawa, each one seeming to outdo the last in its praises of the potential of mass media. The truth of the situation is rarely acknowledged even by educators. It is convenient to perpetuate the myth that our schools are fully exploiting modern technology. Of course it is inevitable that some inroads will be made, that some concessions to contemporary forms will be given, as long as the verbal bastions are left intact. Consequently, the press continues to print stories of atypical situations; television exposes shallow novelty; and the educational journals report on experiments which are on today, but which cease to exist after publication date. There is indeed a need for information revealing the disparate uses of technology and the

The above table shows an increase in the number of teachers within the five-year period of 1,488 or 297 per year. An examination of the table will show that the gains made are in the columns showing the numbers of teachers holding First and Second Class certificates. During the five-year period, the number of teachers holding First Class certificates was increased by 215: the number of teachers holding Second Class certificates was increased by 1,618; the number of teachers holding Third Class certificates was reduced by 345; the number of teachers holding Lower Grade certificates was in 1916, 1,105, and was increased in 1920 to 1,311, falling again to the original figure of 1,105 in 1921.

In estimating the gains made it is always important to remember that teachers of the First Class are being drawn off from year to year for service in Continuation Schools.

No more convincing proof of the steady increase in numbers and qualifications of the teachers could be given than is furnished by this table. It does not seem unreasonable to expect that within a few years it will be possible to announce that for every school in the Province of Ontario there is a qualified teacher available. In the meantime, it may be fairly said that the exodus of teachers from Ontario to the other Provinces is at an end.

Relative Cost of Education in the Different Provinces

Some interesting figures are given in the report of the recent convention of school trustees held in Saskatchewan. These figures show that in the year 1919, the cost per pupil in the publicly controlled schools in the various Provinces was as follows,—

Saskatchewan	$60.79.
British Columbia	58.73.
Alberta	52.89.
Manitoba	46.34.
Ontario	38.73.
Quebec	34.65.
New Brunswick	21.54.
Nova Scotia	19.60.
Prince Edward Island	16.25.

The very considerable increase in the school grants paid in Ontario since that time has resulted in large advances in the salaries paid teachers and this would greatly modify these figures so far as this Province is concerned. But even these advances would fail to justify the criticism sometimes made by the uninformed that the costs of education here are excessive. In 1920, a year later, the cost per pupil in Ontario was still only $47.57.

Visual Instruction

During the year an attempt has been made to discover the value of the moving picture machine and the projection lantern as agencies in education. The projection lantern has found a definite place in the school room and has been used for educational purposes with success for many years. The moving picture machine, whilst it has clearly established itself as a medium for propaganda, has not yet been fully accepted in the ordinary teaching exercises of the school; and it will, perhaps, require some years of careful experiment before the proper method of introducing and handling the moving picture in the class room is discovered. In the meantime, it seems quite clear that for the purpose of suffusing a subject with vivid interest and for the purpose of fixing experiences in the memory, the moving picture machine is one of the teacher's most valuable auxiliaries.

The Department of Education hopes, during the present year, to add to the stock of moving pictures already in its possession, the following,—The Consolidation of Rural Schools, The School Garden, The Play Ground, The Gymnasium. The two latter will be used for their value in connection with the organization of physical education, the other two in the furtherance of the community movement through the medium of the schools.

Inspection of Schools

The appointment of Dr. Karr as Director of Organization of Rural Schools and Mr. Neil McDougall, of Petrolia, as General Inspector will make it possible to give a greater amount of assistance to the Public School Inspectors in carrying on their work.

I am glad to report that the Inspectors in general throughout the Province are giving valuable assistance to the Department in carrying out the various branches of the reorganization now in progress. This has especial reference to the consolidation of rural schools, medical and dental inspection, agricultural education and community organization.

While it is not intended and is not practicable for the Public School Inspector to become responsible for the professional training of teachers, it is still his duty to give such encouragement, direction and advice to the teachers as will enlarge their conception of the work they have to do and stimulate them with a zeal for doing it. This is indeed the most essential part of the work of the Inspector. It is of far more importance that when the Inspector leaves the school he shall have left behind him a new and better insight into the purposes and methods of education than that he should have sedulously fulfilled the more formal part of his duties; and it is safe to say that the man who does the first is not likely to neglect the last.

Teachers should be given every encouragement for the display of initiative. It is always to be remembered, however, that unalloyed liberty is, perhaps, the most doubtful of all blessings. Teachers are to be found, who, if left to their own devices, would devote the greater part of their time to some subject in which they are especially interested. To allow such a teacher to follow his inclinations is to place his school under a serious handicap. The natural aptitude of the pupils has a right to recognition as well as the natural inclination of the teacher; and whilst due allowance should be made for both, both should be regulated. It is worth while to observe that studies for which the child has little natural aptitude may be an admirable means of salutary mental discipline by bringing into play sets of faculties which would otherwise be neglected. A state system of education must always place the emphasis of attention on well balanced attainments, character and personality and it is just at this point that the tact and experience of the Inspector are properly called into play.

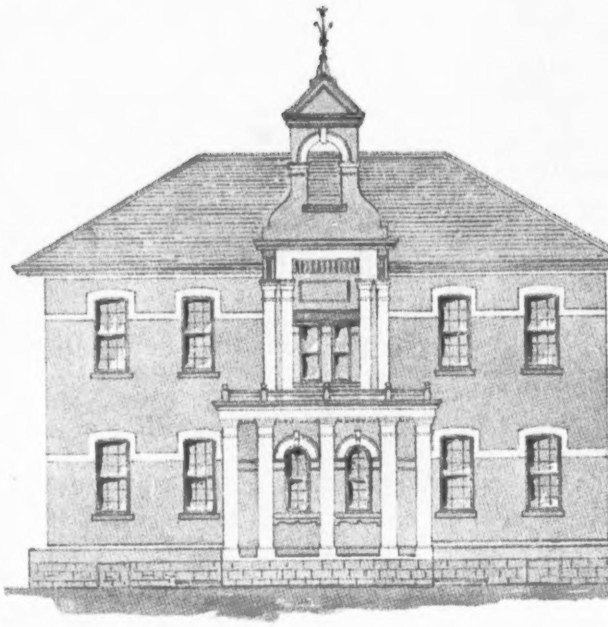
Regulations and Courses of Study

There is some misconception of the privileges granted by the Regulations in respect especially to the latitude permitted in organization and management wide range of attitudes to media, existing in our schools.

Books, maps, slates and other apparatus were to be found in nineteenth century Ontario schools in amounts consistent with the affluence and the enlightenment of the community. There was little pressure upon teachers or taxpayers to acquire more or better teaching aids, and indeed few were available. Much more frequent were the exhortations of the local inspector for the improvement of the firewood supply or sanitary conditions. Occasionally, as in the case of one exasperated Niagara District inspector, an entry would appear in the log book, "Once again I advise the trustees to purchase a large single slate and to frame it upon the front wall of the school room." Drawings appeared in some books on education to show "The Well-Equipped School" and "The Poorly-Equipped School", but these were infrequent and revealed none of the forcefulness of a Ford Foundation programme of the 1960' s.

Nor was the need for learning materials too evident a hundred years ago. In fact, the devices of the day had a limited role - in a true sense they were only teaching aids.

During the life of Egerton Ryerson relatively stable social conditions surrounded the child, and he lived a life which was ordered in large measure by the authoritarian positions of the home, the school, the state, and the church. The time was characterized by the general acceptance of one' s station in life and by unquestioning loyalty to authority. Children were a part of the total adult community, at least in the rural areas which predominated. Their "classroom" was the world, and the rote learning of the school room a part of accepted tradition.



DOVERCOURT VILLAGE SCHOO
18

The electric age began to be felt at the beginning of this century, and with it came "Visual Instruction" to Ontario. Moved by the influence of early experiments in England and the United States, schools and institutions purchased "lanterns", "stereographs", and "delineascopes". Over forty years ago the Honourable R. H. Grant, Minister of Education, was able to say in his annual report, "The projection lantern has found a definite place

n√

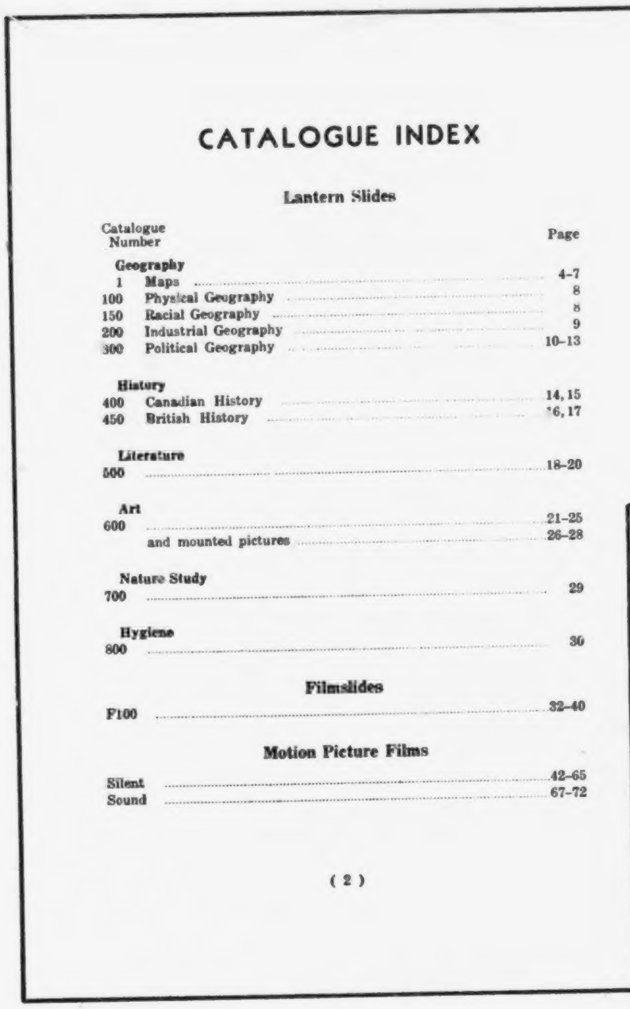
in the school room and has been used for educational purposes with success for many years", and, ".... it seems quite clear that for the purpose of suffusing a subject with vivid interest, and for the purpose of fixing experiences in the memory, the moving picture machine is one of the teacher' s most valuable auxiliaries."

In the following year, 1923, the Minister reported on the appointment of Dr. L. B. Jackes as Director of Visual Instruction, and the acquisition of "three thousand modern lantern slides" which were being arranged in sets for ten day free loan to teachers. The concept was still one of teaching aids. Lecture notes were provided and read verbatim while the slides were projected.

The Minister' s report for 1936 carried a section on "Visual Education" which must certainly have inspired the eager teacher of those depression years. The first paragraph is remarkable for its similarity to contemporary educational writing, although some of the language has changed in thirty years.

"There is no disputing the fact that we are living in an age of appeal through the eye. Illustrated magazines, advertising and pictorial sections of newspapers, comic strips, travelogues, and the cinema all bear proof of the fact; and both art and science are lending their support to the development of colour photography, telephotography, and television." The Minister' s writer waxed positively eloquent as he concluded, "The hand of the teacher who is skilled in adaptation and tactful in the use of time and method will be greatly strengthened, and she will make school not only a more attractive place for the pupil, but an institution where the eye will aid the ear, the hand, and the voice in their service to education."

By 1945 it was possible to forecast an end to priorities and wartime shortages of equipment and materials. The directorate of "Audio-Visual Aids" was revived by the Honourable George Drew, and a Supervisor appointed. Statistics for that year indicate that the school audience for sound and silent motion pictures doubled from 1944. The Department of Education sponsored forty-five radio broadcasts which were produced by the C.B.C.,



CATALOGUE INDEX

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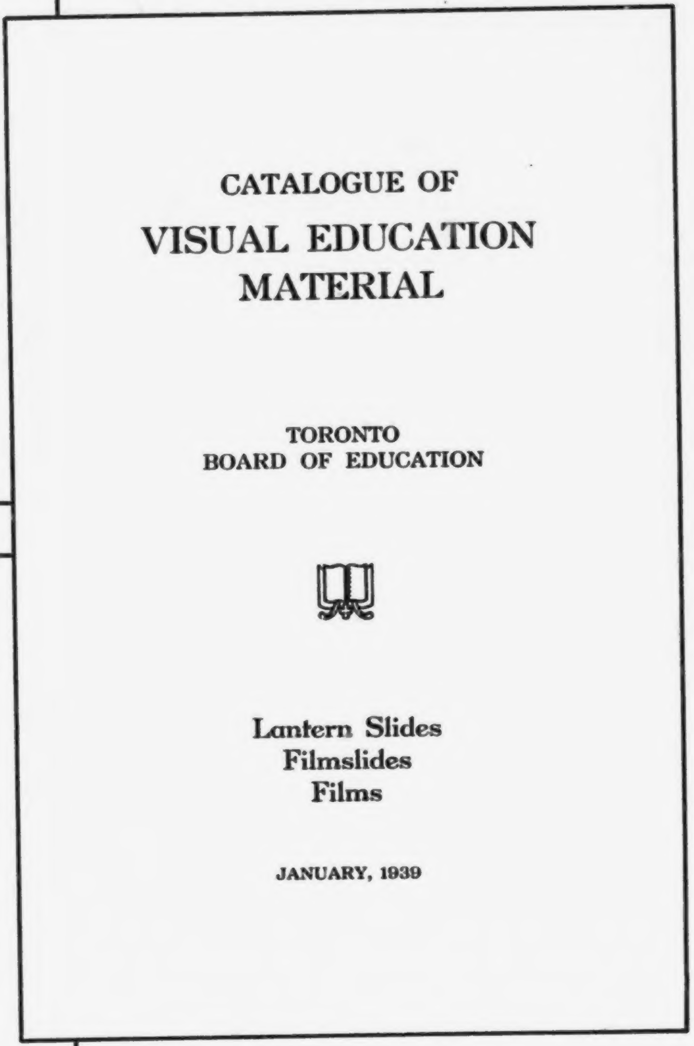
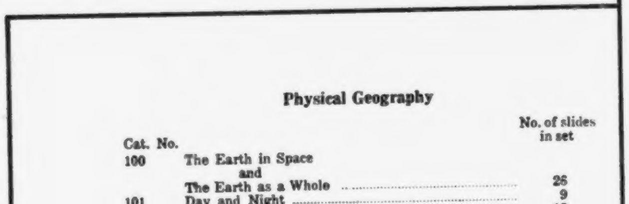


CATALOGUE OF
VISUAL EDUCATION MATERIAL

TORONTO
BOARD OF EDUCATION

Lantern Slides
Filmslides
Films

JANUARY, 1939



Physical Geography

Cat. No.		No. of slides in set
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(8)

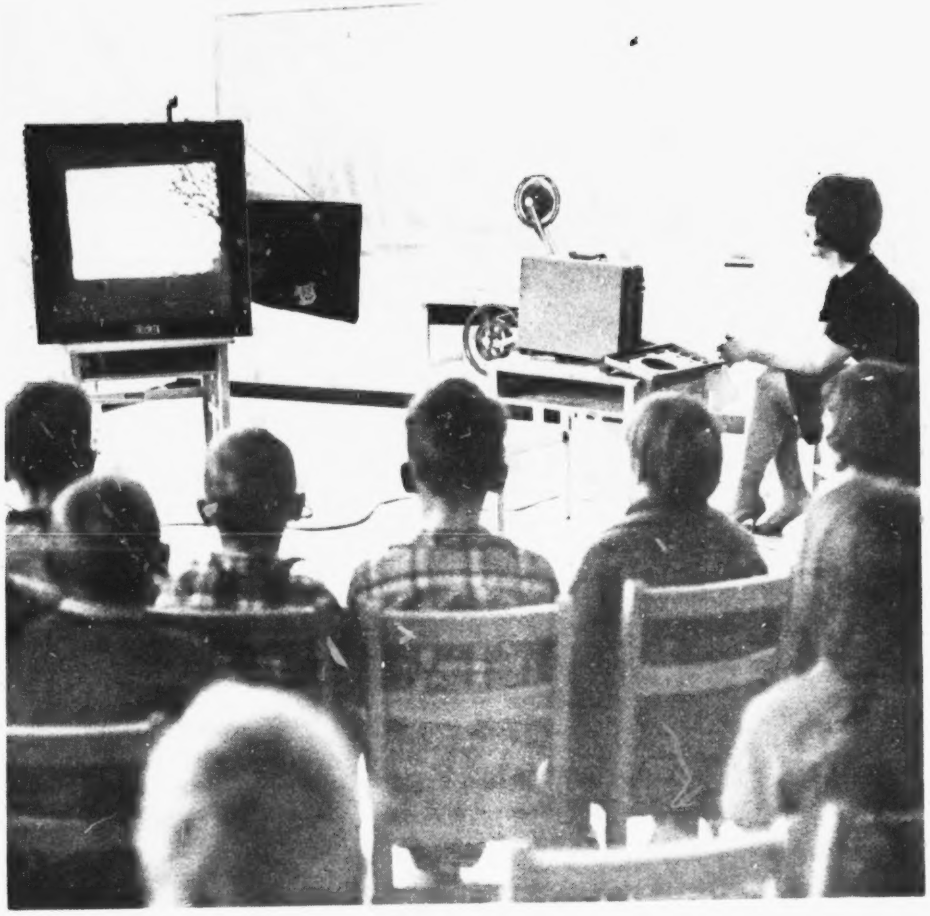
and the air waves carried into many classrooms the memorable announcement of Victory in Europe.

ORGANIZATION FOR THE USE OF MEDIA

Responsibilities for leadership in the use of media approximate those which prevail in other aspects of education. The Ontario Department of Education has, as the quoted reports indicate, played a prominent part. A few municipal boards of education instituted slide and motion picture libraries in the thirties and forties. Under encouragement from the Department there has been significant decentralization during the past ten years. Individual schools have developed the use of technology commensurate with the interest of the principal and the insight of the teachers. In the final analysis, it is the system and its administrators who encourage or inhibit teaching methods, and it is the individual teachers who adopt or reject them.

The Department of Education has encouraged the use of modern learning resources, mainly through the undertakings of its Audio-Visual Education Branch. This branch operates a motion picture film library, organizes summer courses in audio-visual methods for teachers, sponsors the production of radio broadcasts, and acts in a general consultative capacity. The film library, which is one of the largest of its type in North America, provides classroom and teacher training films, at no charge, to any tax-supported school in the province, to the Teachers' Colleges, and to the Ontario College of Education.

An important function of the branch is the organization of a summer course for teachers. Conducted in four centres each year, it is a 125 hour course combining theoretical and practical approaches to classroom use of learning materials. The course covers all aspects of the field from programmed instruction to the preparation of felt-board materials, and is designed to satisfy the needs of all regular elementary school teachers. A very few secondary school teachers take the course. The success of this project may be measured by the tenfold increase in enrolment



since 1956. Each summer over six hundred teachers are graduated.

The Audio-Visual Education Branch continues to co-sponsor with the C.B.C. almost two hundred school broadcasts annually. In addition, it has acted in a consultative role in educational television, in advising film producers, and in many other areas where assistance has been requested.

About fifteen years ago the Director of the Branch saw the advantages to be gained through decentralization. A careful, yet enthusiastic long term programme has resulted in twenty-three municipally-operated film libraries to date. No doubt the Department' s general delegation of responsibility and the recommendations of the Hope Royal Commission on Education gave impetus to this movement. The attitudes and actions of the Department of Education may be said to have a significant effect on the use of technology in the schools.

And what of the local audio-visual programmes? They share very little in common, except perhaps that each has a film library and a head who may be called supervisor, director, or consultant. Historically, the head began his duties as custodian of a film library and advisor on the purchase of equipment. He was likely chosen for the position because he was a good teacher and had desirable technical abilities as well as an interest in the field. Rarely was he selected for his insight into learning processes, his understanding of curriculum, his ability to inspire staff, or his aptitude for business management. As a result, many audio-visual specialists today are functioning mainly as caretakers of equipment, budgets, and personnel, and are separated from the life blood of education - the curriculum. In some cases the audio-visual department is even treated as a special service, operating with school buses and cafeterias outside the academic circle.

In spite of this alarming separation of the method from the content, local programmes have made outstanding contributions to education in Ontario. In some centres, dedicated specialists work far beyond the call of duty to provide services

EQUIPMENT WHERE
IT IS NEEDED

which are recognized increasingly to benefit teaching and learning. Discussions and demonstrations are held with teachers who are contemplating large group instruction, or those who wish to individualize their reading programmes, and so on. In a few cases the specialist is a working member of curriculum committees, helping to mould courses of study with his understanding of modern teaching methods. Many individual teachers in need of special materials are seeking him out to help them with production. Of course, he can respond to their query in two different ways, and all too often in Ontario the latter is chosen. He can concern himself with both the pedagogy and the mechanics, or he can abdicate the educational aspects and become simply a technical consultant - a highly paid clerk. Clearly, if the leadership of the past is to be continued and increased to meet new needs, the local specialist must possess technological understanding, not merely technical know-how. He must have insight into the learning processes and concomitant strategies of communication, and he must be a well-informed generalist in the business of education. His superiors must demand that he be a true leader in education and must supply him with the necessary technical, clerical, and administrative assistance so that he is not sidetracked into trivial oblivion.

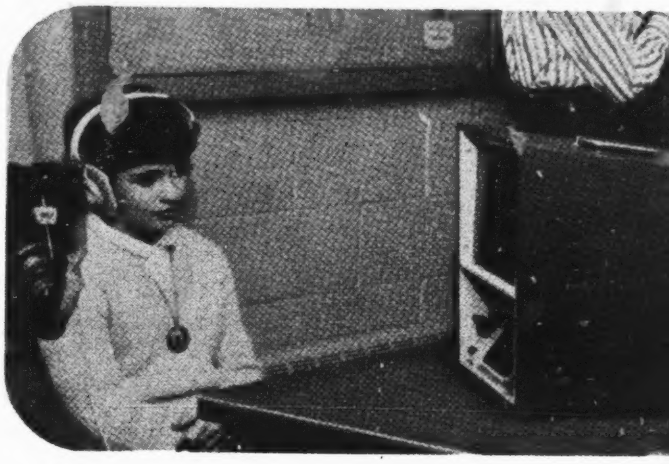
The decentralized local programme need only be carried a step further and it becomes school-centred. Most, but not all of the urban schools in Ontario are equipped with some machinery for the use of learning materials. The progress of any one school in harnessing technology is directly related to the attitudes of the principal. There are secondary schools in Ontario with fifteen or twenty overhead projectors and there are others with none. There are elementary schools wherein each classroom has its own light control, screen, and filmstrip-slide projector, and there are others without the benefit of a single machine. The degree of decentralization is also affected by the cost of materials. For example, few schools have 16 mm. films. Because of their relatively high cost it is considered reasonable to share them from a central library. Filmstrips being about the price of books, can be justified for school and even classroom purchase. This holds particularly true if the materials are well-used as in the case of

"where students are allowed direct access" schools where students are allowed direct access to them.

Much dogma is prevalent about what materials ought to be distributed from which places, and where the materials should be stored when not in use. Current curriculum developments demand that rigid doctrine be discarded in favour of flexible systems. With emphasis shifting to learning, materials must be made available in all appropriate settings; at home, in classrooms and laboratories, in libraries, and in resource centres. It is important that Ontario educators not be led astray by the kind of jurisdictional disputes which have flared up in the United States, to the detriment of both students and teachers. That such wasted effort is possible in our Province is indicated in a published bit of jingo by an Ontario librarian. He attacks the term, "instructional materials centre", in favour of his own brand of jargon - "library-centred school". Integration of all the suppliers of learning materials into the mainstream of education should do much to keep their programmes directly related to the needs of children. Perhaps the greatest need is for "learning-centred schools"!

PREVAILING STANDARDS OF EQUIPMENT, MATERIALS AND FACILITIES

Invention and merchandising in the past ten years have brought a plethora of materials to the doorstep of every school. There is no lack of learning resources available, nor of prospects for further increase. Furthermore, the technical quality of much that is available is excellent, and a growing quantity reflects good aesthetic and pedagogical taste.



Unfortunately the affluence reflected in the abundance of materials has not really struck a responsive note in the souls of most educators. The textbook, chalkboard, and specialized resources such as the language lab excepted, modern media remain on the periphery of learning experience. Only the book receives approval with substance from the Department of Education.

There is no profile available to show either quantity or quality of facilities, materials and

SOME LEARNING RESOURCES IN ONTARIO SCHOOLS

Ontario Curriculum Institute 1965

1. Language development is extended through the use of recordings in kindergartens. Many fine documentaries, prose and poetry readings, and dramas are available for older students.
2. When the classroom is equipped with an inexpensive wall screen and light control, students can easily wheel in and set up a 16 mm. projector for instant use.
3. Television receivers are most useful if mounted on wheeled stands and located on each floor in the school.
4. Children of all ages should have free access to both books and filmstrips. Filmstrips can be used by individuals for research, by placing a projector in a corner of the classroom or locating a viewer in the library.
5. While high school specialists have made extensive use of the overhead projector for illustrating lectures, it is being used increasingly by students and teachers in the elementary schools.
6. The 8mm. cartridge-loaded film is being used in biology labs, health classes, seminar rooms and individual study carrels.
7. School radio, once used only by entire classes, has been found useful in stimulating group discussions and even in providing information to individuals through headphones.

These notes have been prepared to accompany the filmstrip on the opposite page.

equipment available to the teachers and students in Ontario schools. However, the tremendous range that exists can easily be shown.

In one large urban area, all classrooms are provided with opaque drapes or full-closure venetian blinds for light control. In another similar area, elementary schools have an average of one filmstrip projector for every three classrooms and one overhead projector for every sixteen classrooms. One municipality annually budgets twenty-five cents per pupil for filmstrips (an average of $125 per school), another offers $55 per school for all audio-visual needs, and still others rely on the charitable contributions of parents' associations. It may fairly be said that within the Province there are only rare examples of the full exploitation of modern media, and that in the majority of schools the prevailing standards are either mediocre or deplorable.

Reluctance to use educational technology is often attributed to awkward design of equipment. This argument must be questioned when it is realized that cartridge-loading and other simplified machines have not been purchased in abundance by educators. Because of the apparent disinterest of educators, the design of equipment for schools has been fortuitous. The expedient approach of manufacturers interested in mass markets, has been to neglect the design needs of any one segment, and to concentrate on individualizing the marketing approaches. Nor have the educational specialists and administrators faced their responsibilities in this regard. James Finn, writing in Occasional Paper No. 8 of the N. E. A. Technological Development Project, says "The major cliché of educational administration is that the administrator' s only excuse for being is that he is there to help expedite and improve instruction. However, the record shows that at no time have administrators pushed vigorously for the improvement of design in instructional equipment." This is a major challenge to the specialist and one which reinforces further the need for integration of his work with curriculum.

One increasingly serious problem which faces Ontario educators is the technical appraisal of equipment which they may wish to purchase.

The complexity of the situation can be illustrated by the fact that there are over a hundred different tape recorders now on sale in the Province. Objective testing related to the varied requirements of education is badly needed. This is presently being carried on only by the largest Board of Education in Ontario, yet the demand for this information exists everywhere.

The real problems of raising standards of facilities, equipment, and materials hinge largely upon the attitudes of educators. The chalkboard is readily available, without prejudice, at every teaching station. So is electric light (with rare exceptions). Beyond that, our standards of equipment vary according to our prejudices, and are only infrequently related to the needs and interests of students and teachers, or to the availability of suitable materials.

PROFESSIONAL DEVELOPMENT IN THE USE OF MEDIA

With the invention and use of better equipment, the modern craftsman has been able to extend his skill and do jobs that were unthinkable a hundred years ago. The teacher, also, has been given new tools with which to work. Now he must learn to use them. He must acquire at least the same degree of skill in using the tools of his profession as doctors, dentists, and other professionals have attained with theirs.

In Ontario, there are three main agencies for professional training and improvement. In some measure, each of these has undertaken responsibility for increasing teachers' understanding of new media. The teacher-training institutions introduce learning materials to the embryonic teacher, the municipal boards of education and individual school principals arrange for in-service training, and professional organizations such as the Ontario Educational Association and the Federations conduct workshops, seminars and conferences for the whole educational community.

The pre-service training of teachers in the use of new media is of particular importance. In Ontario, recognition of the need to develop an understanding of learning resources is formally acknowledged in only one course - the two year Teachers' College course. This course, which is disappearing next year, includes both theory and practice in the use of audio-visual materials. Other courses at Teachers' Colleges and the College of Education include the use of media according to the interests of the instructors. Emphasis at these institutions is still vested in traditional subject areas and the resulting fragmentation is apt to leave the student teacher with little insight into the total effect and role of learning materials. Equipment, materials, and facilities at the institutions generally reflect the old fallacy that, "Teaching aids make good supplements to the lesson."

If graduates of teacher-training colleges are to understand the potentialities of learning resources, and to adopt the means of communication of the contemporary world, they must be involved in deliberately planned experiences during their training year. A problem is to discover the most effective way of accomplishing this task. Should the learning experiences be part of a formal course, offered in workshop or lab sessions, given through personal consultation, or by some other means? It is imperative that teacher-training institutions in Ontario acquire both the physical means and the curriculum provisions to ensure that all beginning teachers have an understanding of modern learning resources and the technical competence to use them.

ATTITUDES INHIBITING THE USE OF LEARNING RESOURCES

It has puzzled some people that a teacher might enjoy the experiences of viewing coloured slides in the social atmosphere of the home, but reject the idea of using a slide projector in the classroom. There are teachers who would never contemplate the idea of using film or television in current events or literature classes, who themselves appreciate the evening offerings of news and drama.

Reasons why man does not avail himself of new modes are usually related to his fears and

TRAVEL

aspirations, his attitudes and cultural inheritance, but rarely to material or financial shortage. This is true in India when villagers reject a piped water supply because it interferes with the traditional social and business intercourse conducted at the village well, or in Ontario when it is considered "too costly" to provide light control for projection in most classrooms. The authors of "Graphic Communication and the Crisis in Education"[1] devote a large portion of the book to "barriers to optimum use", and most of the barriers are within the context of human attitude.

Recent research (Eichholz and Rogers 1964)[2] in the United States indicates that teachers appear to reject or show a resistance to the adoption of learning materials for several reasons. They include:

a) Rejection because of ignorance or misunderstanding based on a lack of knowledge as to the types and varieties of audio-visual materials available, and the inability to use them.

b) Rejection because of the lack of interest in using the various materials. It was established that teachers who lacked interest and initiative tended to rationalize their non-use of such devices by complaining of shortage of time, other classroom priorities and the need for drills.

c) Rejection of innovation including a tendency to keep to traditional methods and to maintain the status quo was also expressed. These teachers referred to themselves as being the good, old-fashioned teachers.

d) Rejection because the teacher thought that her society did not find innovation acceptable, and therefore did not use it herself. For example, "Children view television programmes at hours when they should be in bed, and therefore television viewing should not be encouraged."

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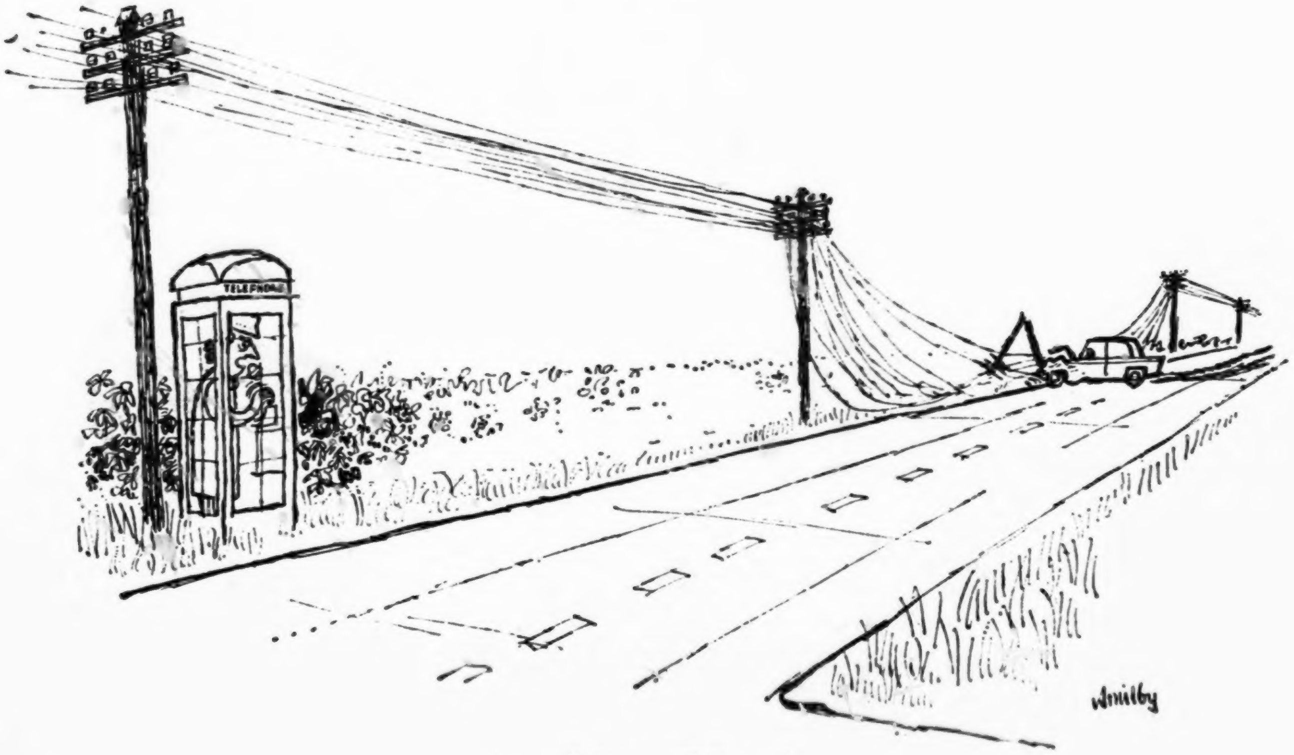
2. Miles, Innovation in Education, Columbia University, 1964.


TELEPHONE
Whitby

'. . . Hello . . . Hello . . .'

e) Rejection of media was also expressed because of interpersonal relationships, indicating the fact that other teachers influenced the curriculum. Non-use by some teachers often made innovation unacceptable in certain schools. It was found that when some teachers or a principal were enthusiastic over new media, the rejectors' attitudes changed and they became 'converted' and exchange of materials even resulted.

f) Rejection because of unfounded, erroneous, illogical reasoning was also expressed. For example, teachers rationalized their rejection by such remarks as "discussing a movie is not as good as an explanation on a blackboard", "audio-visual materials are more suitable for lower grades", "a television programme in school time might be misconstrued as fun".

g) Rejection through fulfillment is expressed by teachers who, having proved to their own satisfaction that they have found the best way, will ignore all other techniques. For example, "The blackboard serves all visual needs".

h) Rejection through experience was indicated by teachers relating some incident when an innovation was made but failed. Such experiences might include the use of a projector that had broken down and was never used again or a selected film that turned out to be disappointing.

Eichholz and Rogers[1] freely admit that their findings were not completely conclusive. For example, the rejectors were not selected according to age and teaching experience. Furthermore, no teacher, even though classified as a rejector was against the use of all media. About 50 per cent of the teachers interviewed expressed rejection through default, while 93 per cent of the sample group expressed rejection through experience.

Whatever deduction that might be drawn from the above findings, it would appear that

REFERENCE

1. Miles, Innovation in Education, Columbia University, 1964.

teachers have definite prejudices which influence the use of instructional materials in their classrooms.

Human attitude as a barrier to progress is recognized by a number of contemporary educators. In the Brickell study[1], Commissioner of Education, James E. Allan Jr. (New York State) is quoted .... "These efforts, however, are not enough. We need to know how best to bring to bear the total educational resources of the State in a massive attack on resistance, lethargy, and blocks to constructive change." In a paper prepared for the United States Office of Education, William Allen states[2] as one conclusion of research done before 1958, "Teacher inertia (which may have various causes) is one of the outstanding deterrents to the use of the newer media."

At official levels, the need to use the new technology is admitted, but with insufficient enthusiasm to bring about action. Samuel Cohen in analyzing the situation in one school area (which would be considered advanced in Ontario) says[3] that while "audio-visual materials and equipment are accepted almost universally at the verbal level, the practice of audio-visual techniques in the classroom is approximately at the level described in the literature of twenty years ago."

While current writings acknowledge the role of attitude in the process of change, they tend to deal with it as a one-dimensional problem. Even Brickell' s worthy study falls into this trap. He says, "New types of instructional programmes are introduced by administrators. Contrary to general opinion, teachers are not change agents for instructional innovations of major scope." This feeling was expressed by Dale[4] in 1954, "In public schools we find that the administrator' s concepts of teaching are of even more critical importance than those of teachers", and in a 1958 publication[5] of the N. E. A. which entitles one section, "Only the Administrator Can Put Substantial Changes into Effect."

One feels that these writers would be satisfied with the appearance of change and hold no torch for progress in a fundamental and radical sense. Even the most generous who stroll the pathways of Ontario' s educational vineyards find much old wine in new aerosol containers.

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1. Henry M. Brickell, Organizing New York State for Educational Change, Albany, 1961
2. Technological Development Project, U.S. Office of Education, 1963
3. Samuel Cohen, The Import of the Wantagh Interviews and a Modest Proposal for Next Steps. Audiovisual Instruction, January, 1964
4. Audio-Visual Methods in Teaching, Holt-Dryden, 1954
5. Mass Communication and Education, N. E. A., 1958

C. E. Wilkinson, Audio-Visual Consultant for Scarborough Board of Education, considers the municipal superintendent to be a vital influence in the development of effective use of audio-visual methods. He offered the following advice to a recent meeting of superintendents.[1]

"As a superintendent, what is your role in effecting an improvement in Education by the careful integration of audio-visual media into the pattern of instruction?

In order that there may be an effective Audio-Visual Programme there are four basic requirements:

1) Blackout facilities must be provided for every classroom. As long as a teacher and his students must move from their classroom to another area there can not be a full measure of integration of projected audio-visual media into the whole pattern of instruction.

   Teachers are sometimes heard to make the remark, 'I haven't time to show moving pictures, filmstrips, or slides if I am to cover the course of study'.

   Well, let us provide materials and conditions so that we can truly reply, 'That is an inane remark. Audio-visual media enable a good teacher to teach better, and to teach more in a shorter time; and the students have greater and longer retention of the knowledge gained'.

2) There must be adequate provision of audio-visual equipment so that each teacher may use audio-visual media for effective instruction at any time, and not be hampered by inability to have the equipment when he needs it.

3) The materials for audio-visual instruction must be made available to the classroom teacher when he needs them for the task in hand, or the use of such

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REFERENCE

[1] C. E. Wilkinson, The Role of a Superintendent in Audio-Visual Instruction, unpublished paper, Scarborough, 1964

INSPIRATION

materials can not be properly integrated into the pattern of instruction.

4) Audio-visual instruction is a highly specialized field. Skill in leadership in this field comes from special interest, talent, long experience, and general education equivalent to that of principals and supervisors. Only a teacher with such qualifications can give help and guidance to teachers, principals, supervisors, and superintendents in all of the facets of this special field.

These are the four basic requirements. One of these will not suffice, nor will two, or three. All four are necessary."

While we have little documented evidence, we must conclude that modern instructional materials in Ontario today play a very minor role, that most teachers have not yet learned to use them with ease and effectiveness, that administrators grudgingly admit them as a special service, that inspectors and instructional supervisors often inhibit their use, and that the instructional materials specialist himself may consider them only in relation to print and verbal learning.

FUTURE PROSPECTS

Without leadership or inspiration, the present evolution of education and society would bring an increasing abundance of things technological to the schools. That this would lead to either increased learning or lower tax rates is doubtful. Drifting into abundance is no more desirable than drifting into oblivion.

But changes are afoot in Ontario. Demands of new curricula, new patterns of organization, and tacit acceptance by educators of the presence of contemporary communications systems are straining the traditional bonds of inertia. With leadership from the top which seeks to effect fundamental attitude changes throughout the system, and not simply to overlay new administrative procedures,

the contribution of new media to education in the Province will be enormous.

New schools will be built which are truly designed to facilitate the use of all types of learning resources by students and teachers alike.

Instructional materials of inspired quality will be produced as an integral part of curriculum needs.

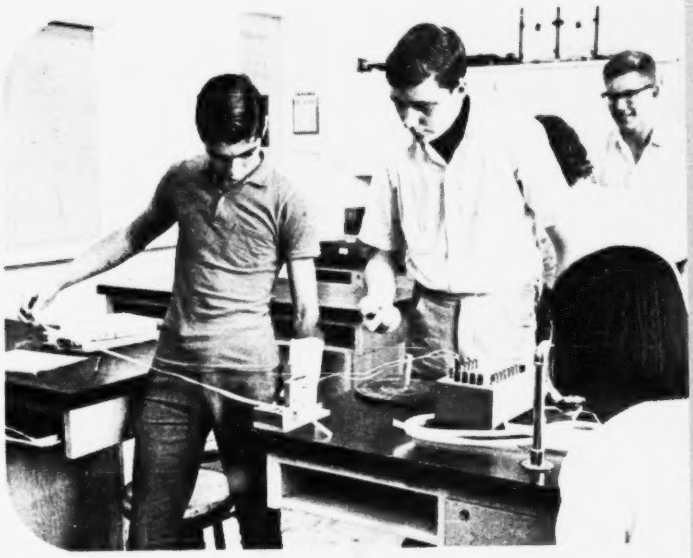
Equipment will be designed and built to precisely meet the requirements of school programmes.

Learning materials will become abundantly available to the learner, wherever he might be. Through many channels he will be able to acquire what he needs when he needs it.

Individual consultative service to teachers will embrace both technical and pedagogical aspects, and will be freely available. As Samuel Cohen says,[1] "No matter how excellent the audio-visual centre, how abundant the supply of equipment and materials, how up-to-date the audio-visual bulletins and catalogues, how capable the student operators, or how efficient the distribution and maintenance system, the teacher must have opportunity and time for individual consultation with the audio-visual specialist. For it is only the audio-visual specialist who can help the teacher select and apply the techniques specifically required for his or her subject and grade level".

The audio-visual specialist will increasingly become a part of the curriculum "team" and will share equally with subject specialists and others in planning and implementing curricula. He will lose his identity as a purveyor of machines. As Trow puts it,[2] "The audio-visualist should be more in demand as one who is expected to promote an improved educational programme. He does not just run a hardware store, nor is he merely an authority on the care and treatment of gadgets. He has been thought of in the role of a learning technologist who is essentially an innovator, and as a supervisor of instructional resources. He will be a professional educator who understands the teaching-learning processes, and is familiar with the sources of materials and of their possible uses in connection with the various school subjects".

The future prospects for educational technology in the schools of Ontario are bright. The option is ours.



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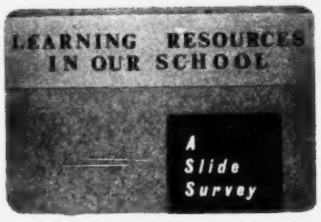
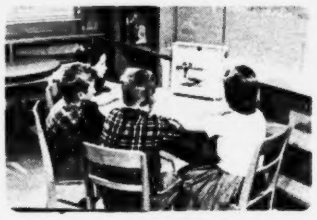
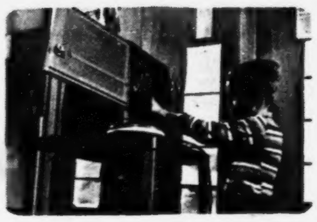
2. Trow, Teacher and Technology, Appleton-Century-Crofts, 1963







CONDUCT A PHOTOGRAPHIC SURVEY OF YOUR SCHOOL

What facilities does your school have for the use of projected materials?

How much use is made of all learning resources by students?

Are films, filmstrips, and recordings readily available?

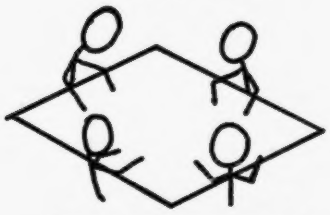
Do students and teachers know how to operate equipment?

When a teacher wishes to use a film, does the organization make it easy to do so?

Is modern equipment available in sufficient quantity?

Does supervisory staff encourage teachers to use audio-visual materials as an integral part of teaching and learning?

STEP ONE

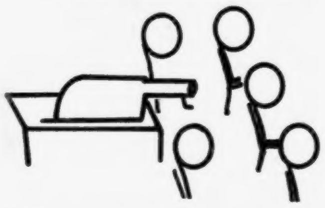


Plan a slide survey with teachers and supervisors.

STEP TWO

Take photographs. Use the three slides included here as starters if you wish.

STEP THREE



Report to and discuss with staff, Board of Education, parents.

The slides mounted on this page may be peeled off and used as a part of your slide survey.

SELECTED CASE STUDIES IN CURRENT PRACTICE

- urban elementary school

Teachers in this school are able to select audio-visual materials from several sources. Primary grade classrooms particularly, are equipped with their own charts and manipulative materials. The school has a collection of about one hundred and eighty filmstrips, kept in a cabinet in the secretary's office. There is also a small collection of recordings and a picture file which was started three years ago by a group of young teachers.

A wealth of outside resources is available. The school has one television set and over two hundred programmes from which to choose each year. The central sound system is capable of bringing school radio broadcasts to all classrooms, although some of the teachers who use programmes prefer to borrow one of the three portable radios. In this way they can be sure of tuning in the broadcast at the correct time.

A central film library delivers motion pictures every week, and a consultant is available to assist with their use. About one-third of the teachers use at least one film every month. Some never order, but may occasionally join with another class to view a film. This happens most frequently before holiday periods.

Two or three teachers are very enthusiastic about the potential of film in their classrooms. They order for every week by sending a note to the secretary about ten days before the delivery date. A week later, a confirmation is received which reveals that four of every ten titles ordered will not be available. This poses a real problem for those teachers who try to integrate film into their curriculum. For the others who consider film as enrichment, sixty per cent service presents no difficulty.

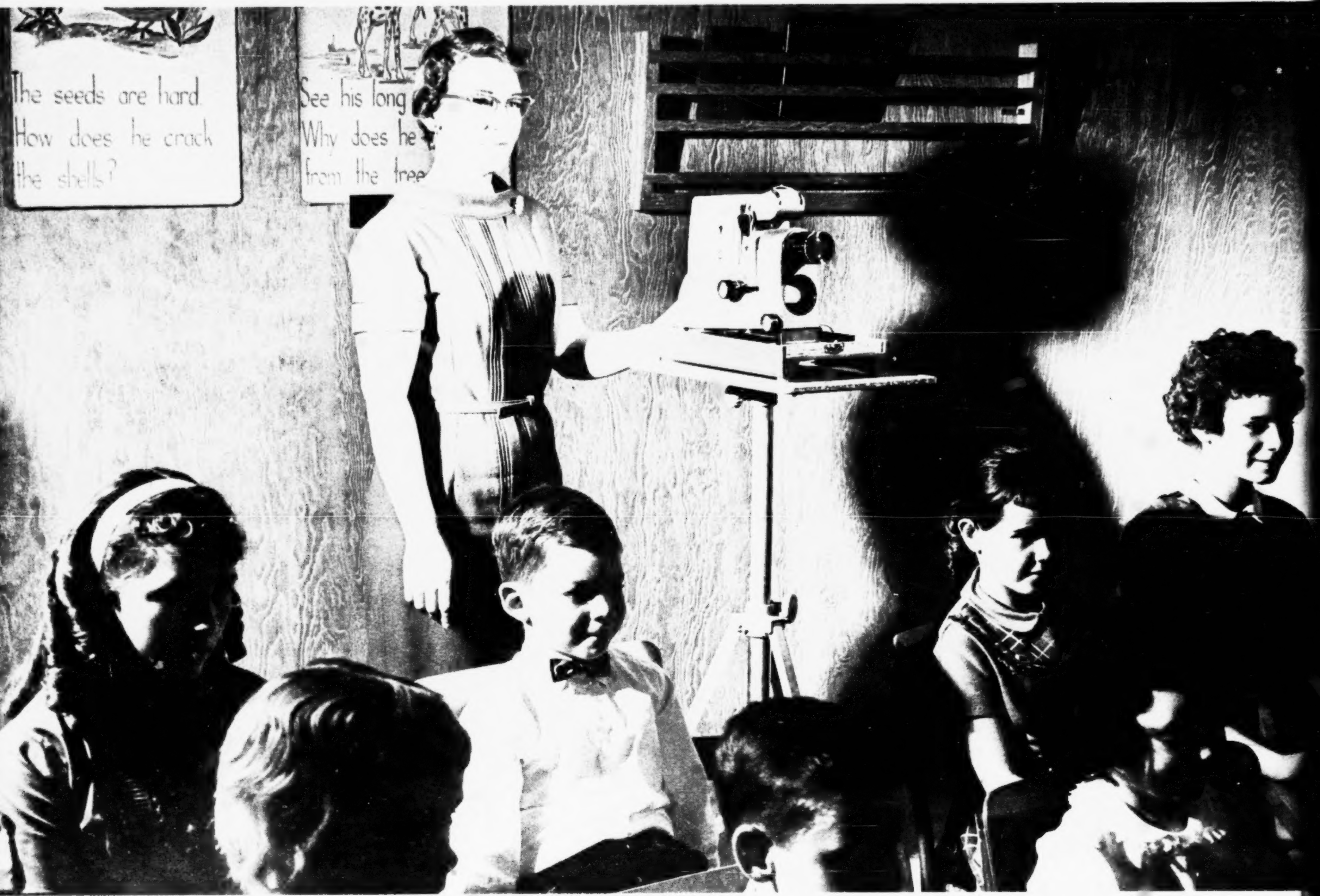
Light control drapes have been installed in six classrooms and there is a basement storage room with benches which is used as a projection room. Since it is easier to leave the projector in one place, the classrooms are rarely used for viewing films.

One teacher on the staff is called the audio-visual co-ordinator. He schedules and maintains equipment, distributes catalogues and bulletins, and is often called on to operate a projector, tune the television set, or find a lost film.

The principal considers his audio-visual programme to be reasonably effective. Use of materials and equipment has increased in recent years and there is growing interest. He would like to obtain an overhead projector in the next budget, and he points out that no longer does he need to rely on the Home and School Association for funds.

Some of the teachers have been trained in the operation of equipment by the consultant, and one or two have had him teach a demonstration lesson. The consultant plans to purchase equipment for the preparation of overhead transparencies, to meet the growing interest in this technique. He has tested out grease pencils and other materials for overhead projection, and has prepared a basic list for schools.

Articles on expanding ideas in audio-visual education seem to leave this school relatively untouched. At present there are no plans for individual student use of materials, for materials preparation centres, or for close integration of learning resources into the curriculum. However, the principal has indicated that, "If the Board wishes to use our school for an experiment, we shall be pleased to co-operate".



The teacher in this classroom considers audio-visual methods to be "useful in holding the children' s attention" and "making them aware of the world outside the classroom". During her five years of teaching, she has acquired an extensive number of pictures, clippings, charts, and devices to use with her grade four class. She is also able to borrow various materials including films, filmstrips, recordings, and picture sets from a central audio-visual service operated by the Board of Education.

When she sits down at her desk after four o' clock on Thursday to plan some of the details for her next week' s programme, she finds it is too late to order materials from the film library. Consequently, she has devised a type of continuous planning which allows her to use loan materials which must be ordered over a week in advance. While planning specifically for the following week, she also plans generally for the two weeks beyond.

In selecting materials, she relies on her memories of previous years, recommendations of fellow teachers, and a search of the film catalogue for something specific. It is sometimes quite a task to find suitable material complete with a second and third choice to allow for limited availability.

A few days after ordering, she receives a confirmation which is useful in guiding her detailed planning. It is then necessary for her to reserve the equipment for the required time. She uses filmstrips in her own classroom with a so-called "daylight" screen, and it is necessary to book the projector, screen, and extension cord on the sheet tacked on to the teachers' bulletin board. Motion pictures don' t show up well in her classroom, particularly on a sunny day. To use this medium, she must reserve the "visual aids" room, a vacant classroom on the second floor.

While this teacher selects the material she uses to relate directly to the topics in her course of study, the rigidity inherent in obtaining and using it means that it is not used in the way she uses other classroom experiences. Creative dramatics, discussion, textbook study, can all be organized on the spot and introduced at any moment. The use of learning resources which require borrowed equipment and materials has isolated audio-visual techniques into fringe benefits. Even those materials which she has collected from year to year sit in a back cupboard relatively unused. Spring cleaning has often revealed a picture set whose useful time is now past, and has shown again the failure of horizontal filing on secluded shelves.

The students in this class are always eager to view a film or a telecast. These media provide a welcome relief from the usual verbal barrage. Some machines such as the tape recorder are very infrequently used by this teacher, and are still a great novelty.

When audio-visual materials are introduced into this classroom, they are usually treated as a source of "facts" or data, rather than a stimulating human experience. Questions direct the children to remember and enumerate the "whats" of the programme, and rarely to discuss and evaluate the "whys".

The problems of integrating learning resources are clearly evident here.

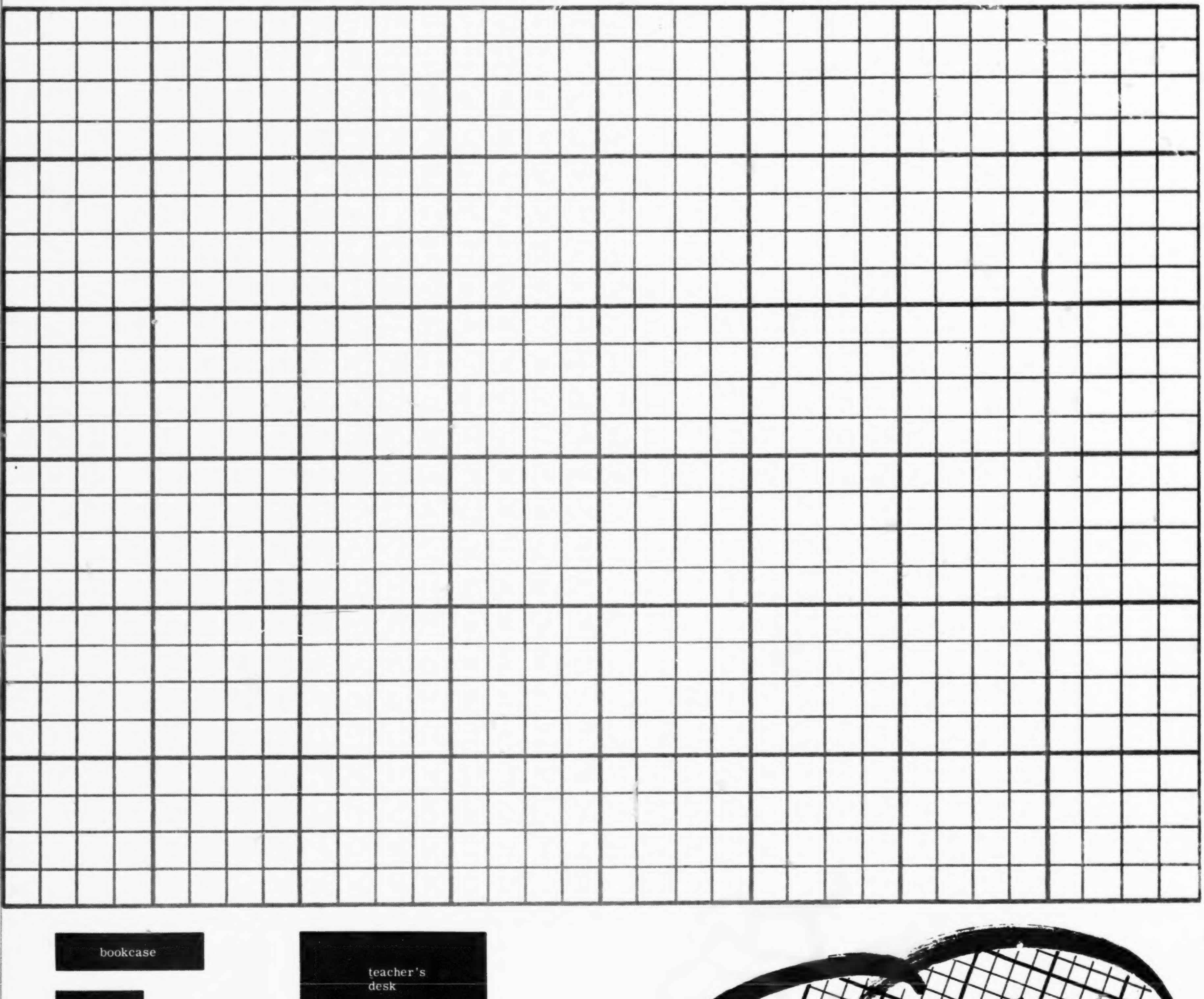
DESIGN YOUR CLASSROOM TO FACILITATE LEARNING

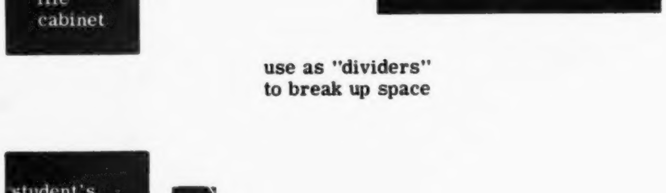
The sterile rows of desks in many classrooms are reminiscent of files of Prussian soldiers, presided over by an authoritarian sergeant with a larger desk.

Re-arrangements of classroom furniture can help to create a laboratory for learning. Of course, the movement of desks alone accomplishes nothing. The programme must also be changed to permit discussion, individual study and research, group reporting, and free access to a variety of materials.

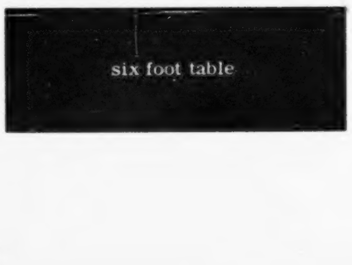
Using the pattern below which represents a 24' x 32' classroom (scale 1/4":1'), and furniture shapes of the size shown at the bottom of the page, you can design a classroom to accommodate children's needs and interests. Mark in electrical outlets, cupboards and other permanent fixtures. Then manipulate cut-out furniture shapes to achieve the desired arrangement.

The practical value of the plan can only be assessed in action. Once the tradition of rows is broken, the possibilities for a variety of learning activities are endless.

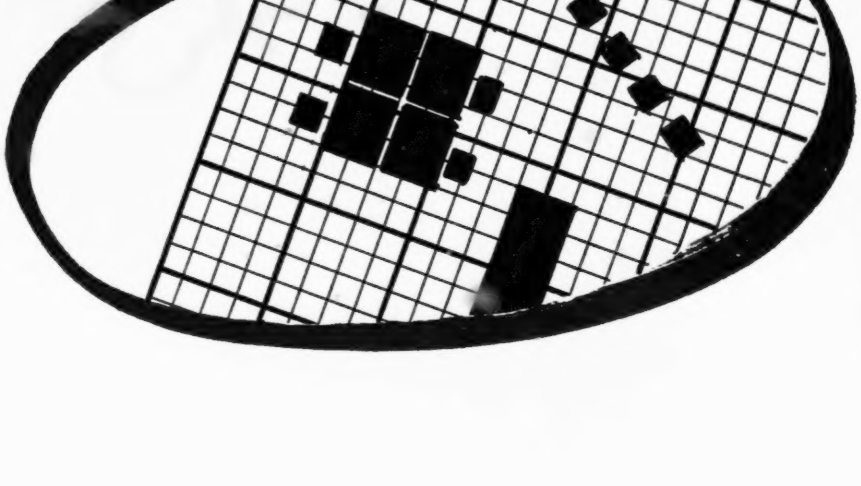




use as "dividers" to break up space



use as work surfaces



This classroom is completely different. At first the difference may seem to lie in the abundance of materials and equipment, in the grouping of students' desks, or in the existence of two eight foot dividers that swing out into the classroom from the corridor wall. A visit with the class in session reveals the basic difference.

Students in this room are self-directed. They have established purposes and rules of conduct themselves. The teacher' s role here is to inspire, advise, and occasionally remind. Learning resources are essential to this kind of programme.

The classroom has its own filmstrip projector, aquarium, screen, record player with headphones, books, microscope, encyclopaedia, globe, filmstrip viewer, and self-contained 8 mm. cartridge-load projector. In an adjacent storeroom there is a 16 mm. projector and a portable science lab to be shared by four classes.

The school itself is well supplied with learning materials by current standards. In addition to the library, there is a resource centre to which individual students may come at any time they have their teacher' s permission. The centre has reference books, tables and chairs, and a variety of audio-visual equipment located in five carrels along one wall. There is a tape recorder with headset, a record player, two filmstrip viewers, and an 8 mm. cartridge projector. Mounted on the walls are filmstrips (about four hundred), recordings, and 8 mm. films. A number of models and devices are also located on shelves in the room.

Each of the eighteen classrooms in the building has its own light control, wall screen, radio reception, and filmstrip - slide projector. The school as a whole is served with two 16 mm. projectors, three tape recorders, three record players, two 8 mm. projectors, two television sets, and two overhead projectors, in addition to the equipment in the resource centre and the atypical classroom.

To complement the school' s resources, the Board of Education provides films and other materials through a daily delivery service, and extra equipment on long term loan. School buses are available so that field trips are taken at no expense to students.

The teacher in what we have chosen to call the "atypical" class has made all materials directly available to her students, without restriction. They move freely about the classroom, view 16 mm. films in the adjoining storeroom, and work in the resource centre if they so desire. Students work in groups, exploring problems and topics co-operatively. When a group has satisfied itself that it is ready, a topic is presented to the whole class. Non-book materials are used by the students in their presentations.

This shift in emphasis from teaching to learning has remarkable consequences. Surrounded with a variety of materials, the students analyze, synthesize, and create their own meaning, rather than to paraphrase the encyclopaedia in the customary manner. Their abilities to evaluate and then to articulate are heightened. They use learning resources as sources of information and experience, and as creative media of expression. This full exploitation of contemporary media is all too rare.

The students attending this secondary school are able to choose from a complete offering of five year, four year, and terminal courses. Located in a middle class suburb, the school enrols most students in the five year arts course.

One staff member has been designated as audio-visual co-ordinator. This duty is considered to be the equivalent of extra-curricular coaching, music direction, or club sponsorship. No extra time or salary is provided. His activities include the organization and training of student projectionists, responsibility for the maintenance and scheduling of the school' s general pool of equipment, and direction of the operation of the auditorium projection, sound, and lighting equipment.

Films are available from a Board of Education library, a local film council, and the Department of Education. They are used regularly by four or five teachers. Most teachers use them rarely or not at all because of several factors. They do not feel that they "have time" to devote to the potential richness of film experience (similarly, many students feel that they do not "have time" to read novels, but prefer to read about them in a "Coles" summary). Teachers are also faced with schedules which require them to move from room to room, making it difficult to use equipment which is not truly portable. Only about half of the classrooms in this school are equipped with light control, which adds another hazard to the method. An average of six films per week is ordered, and three or four are received. One of the office assistants looks after all the clerical details of ordering and receiving material.

Last year, the school received two television sets which were part of a general order for all schools in the municipality. Because of difficulties in scheduling, these have not yet been used.

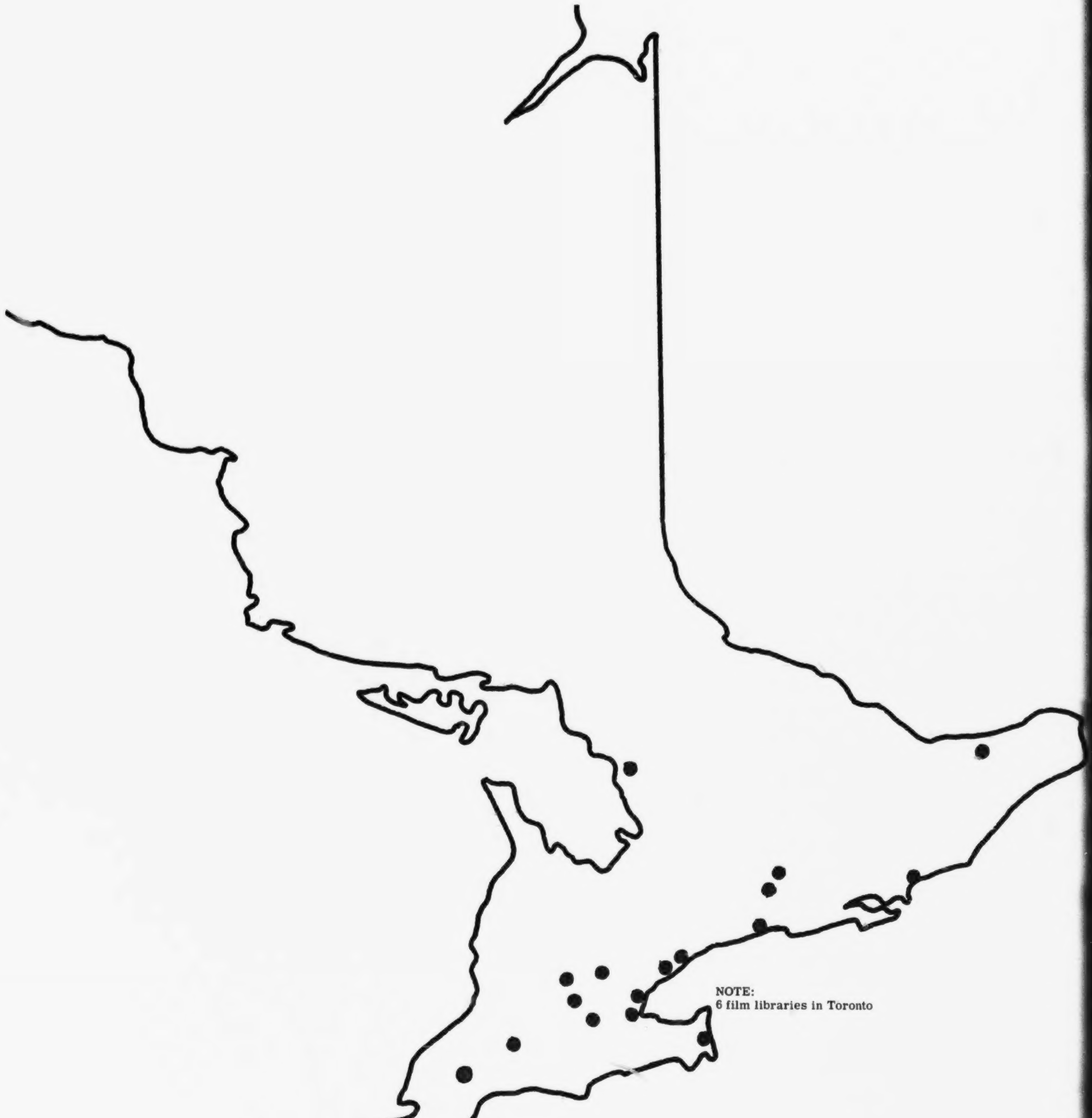
Other equipment in the general pool includes two tape recorders, two 16 mm. projectors, two filmstrip projectors, five overhead projectors, and an opaque projector. This is sufficient to meet casual needs. Teachers who require equipment frequently must order it through their department' s budget. Thus the music department has its own record player, the English department a tape recorder, geography has two automatic slide projectors, the history department purchased a filmstrip projector, and the mathematics department has budgeted for an overhead projector in 1965.

Each department has a small office or preparation room in which teachers store and prepare teaching materials. The math department has equipment for making overhead transparencies and the English department has a radio tuner with connections to permit taping of the school broadcasts. A large collection of slides and filmstrips rests in the geography preparation room and a few filmstrips are also to be found in the history and guidance offices.

The school has a large and attractive library which presently contains books and a vertical file. The English head is discussing with the librarian the possibilities of including a record player with headsets in the reading room. At the moment, an extensive collection of literature recordings is stored in the English office, unused by students.

The need for a unified approach to learning resources is clear to many of the staff in this school.

BOARD OF EDUCATION FILM LIBRARIES IN ONTARIO



NOTE:
6 film libraries in Toronto

A centralized audio-visual programme was instituted by this city seven years ago. Its original purpose was to improve teaching in the elementary schools by providing the services of a consultant knowledgeable in the new media, and through the establishment of a local film library. The films were selected by checking the circulation records of the Department of Education and other established municipal audio-visual programmes, as well as through previewing by local teachers.

From the beginning, the consultant identified himself with the academic programme. He worked closely with the inspectors and other consultants to improve instruction. About eighty per cent of his time was spent in schools, teaching demonstration lessons, assisting in the planning of study units, holding workshops and staff meetings, and advising principals.

The film library was established with the material assistance of the Department of Education, Audio-Visual Branch. About two hundred films were obtained, half of them on deposit from the Branch. The number of films required was in direct one-to-one relationship to the number of teachers on staff. This ratio had been found to serve well in the establishment of local film libraries throughout the Province. A part-time secretary handled all the clerical duties of the film library, including the processing of orders, inspection and repair of films, shipping and receiving, and secretarial duties for the consultant.

As the programme developed during the first year, it was necessary to add materials and equipment which could be loaned or deposited in the schools to create further interest and advance new teaching methods. For example, the consultant found the use of filmstrips to be almost non-existent, even in schools possessing projectors and filmstrips. The purchase of a hundred new titles which were loaned or given to schools, served to arouse interest. Demonstrations of the many approaches to filmstrip use, combined with the solving of projection difficulties, established the use of this medium. Several tape recorders were purchased and their uses in teaching demonstrated.

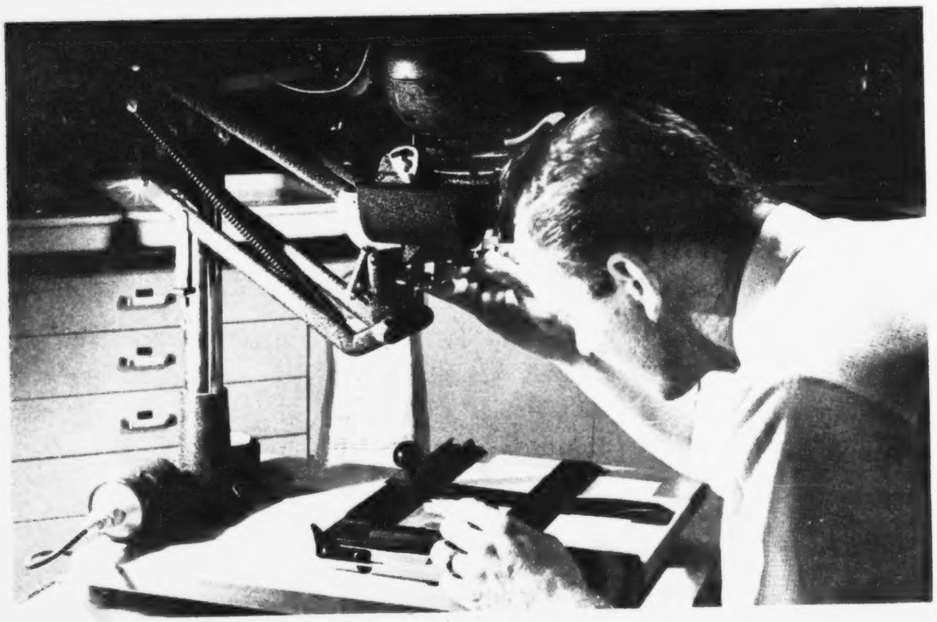
In this city, the annual budget for the centralized programme (exclusive of salaries and overhead) has mounted from fifty cents per pupil to about $1.20 where it currently stands. Each principal is responsible for his own school' s needs, and the average school budget for audio-visual materials (not including maps or science equipment) is close to $1.50 per pupil.

One of the obstacles to greater use of projected materials has been the small number of rooms with light control. It was realized that the most effective environment for the use of these resources was the classroom. A long range plan was adopted to install opaque drapes in existing schools, and a policy of building light control into new schools was enacted. At present, while about one-quarter of all classrooms have opaque drapes, there is still some use of basement and utility rooms for projection.

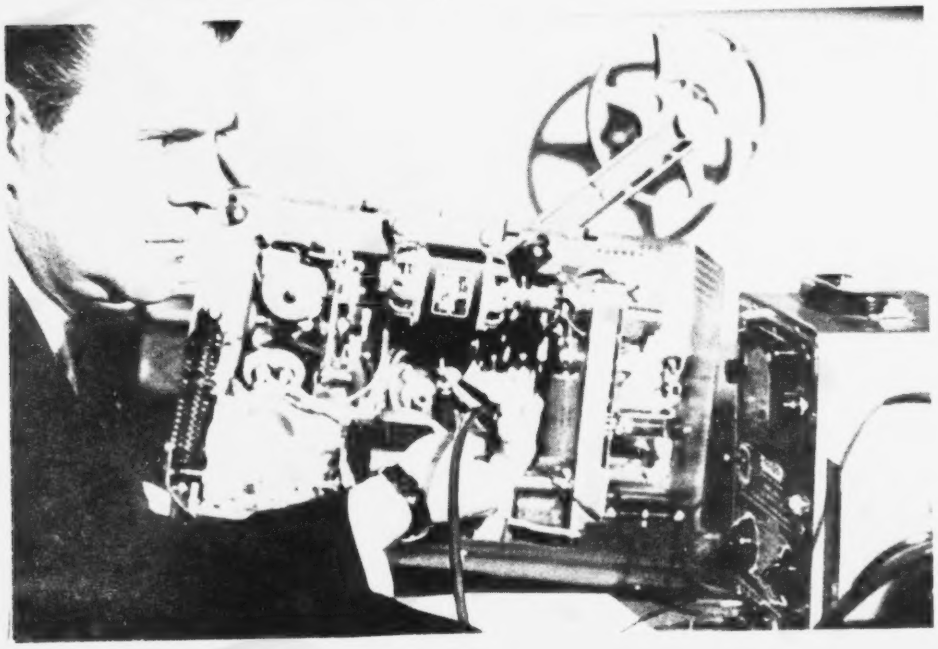
During the seven years of growth, there has been a noticeable change in the attitudes of teachers and supervisors. While it was necessary at one time to "promote" the use of audio-visual methods, it is currently difficult for the audio-visual department, now serving secondary schools as well as elementary, to keep up with the demands for consultation and service.

TEACHER-TRAINING

DISTRIBUTION



PRODUCTION



TESTING AND DEVELOPMENT

A key principle in the philosophy of this school system is the provision of educational opportunities for all types of students. The audio-visual department reflects this outlook by providing a wide range of materials and services to both teachers and administrators.

The department is established under a special services branch and serves elementary, secondary, and adult schools. It is housed in the curriculum area of the Board of Education administration building where it occupies over 5,000 square feet.

Services which are offered may be categorized under the following headings: teacher-training, distribution, production, and testing and development. A director administers the department with the aid of an assistant and a secretary. Four consultants work with teachers and share in planning and administration. Fifteen production, clerical, and technical personnel are employed to annually distribute over 30,000 teaching aids, to assist with the needs of over 2,000 teachers who visit the department each year, and to complete more than a hundred production assignments each month.

The evolution of this department since its inception would make an interesting study. It has been characterized by a responsiveness to the requests of teachers, principals, and supervisory staff. The visitor here today sees only the mature stage of a long period of growth in a well-established school system.

One of the most satisfying developments in the department' s programme is the marked increase in the use of the facilities provided for teachers to make their own instructional materials. Some of the products of this programme include: building feltboards and other display devices for classroom use; dry-mounting and laminating pictures; making colourful signs for bulletin boards and class projects; hot-pressing award ribbons; producing masters for use on spirit duplicators, and transparencies for showing on overhead projectors; developing negatives of photographs taken in classrooms, and processing enlargements of these negatives; making slides and filmstrips in colour or black and white; producing 8 mm. motion pictures. The available facilities make it possible for a number of teachers to be accommodated each school day, and for them to work independently of each other and without interfering with the regular work of the department' s staff.

In addition to the work done by the teachers themselves, training in the production and utilization of teaching aids is given through more formal courses presented at intervals throughout the school year.

The production programme includes the preparation of slides, graphics, recordings on discs and tapes, printed booklets, motion pictures, and television programmes. These are organized and produced by the department' s staff using modern studio and darkroom facilities and professional sound and photographic equipment.

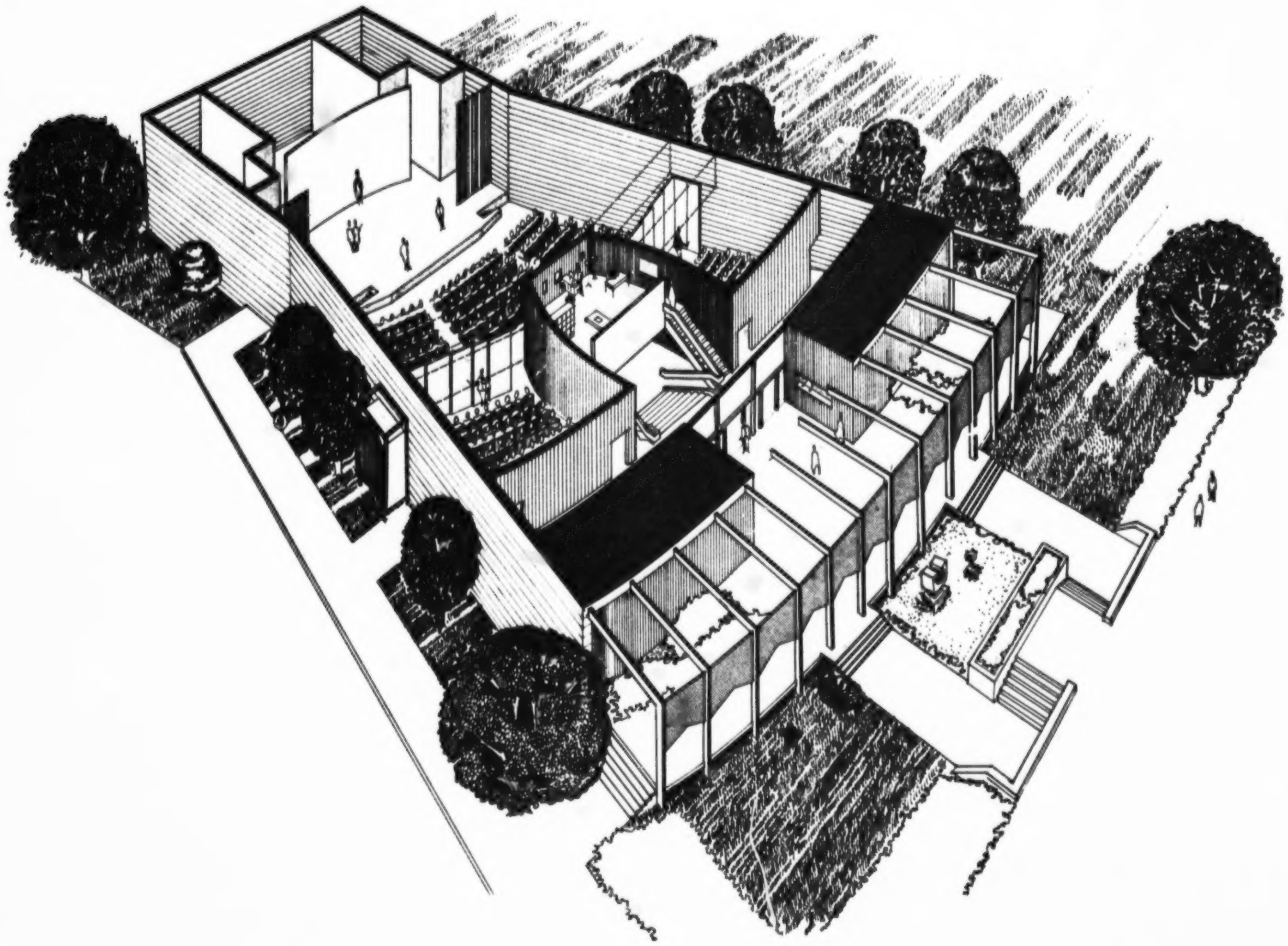
The complexity and sophistication of this department' s services often leave the visitor in awe. It is important to remember that it has developed over many years, as a service department in an established school system which prides itself in its provision of a variety of opportunities for its students.

REQUIREMENTS FOR PROGRESS

This preliminary study does not present a complete picture of audio-visual education in Ontario. It has revealed substantial variations from what might be described as good practice, and it has indicated problem areas which are begging for both immediate and long term solutions. If advances are to be consciously achieved, answers must be sought to the many questions that have been raised. Some requirements for progress are summarized in this section.

RESEARCH

1. The literature abounds with descriptions of research projects which have been conducted in the areas of concern. A thorough study of these research projects, based on a review of Canadian, American, and British publications should be made in order to identify



those findings which are most relevant to the current needs of education in Ontario.

2. The relationship between media and curriculum is presently ill-defined. McLuhan' s expression, "the medium is the message",[1] is not very enlightening to the practitioner. It is recommended that research be conducted on this topic, and that the findings be disseminated in readable form.

3. The attitudes of teachers and administrators are acknowledged to be significant in determining classroom practices. A modification of Brickell' s study,[2] focused on the use of instructional technology in Ontario, should be undertaken in an attempt to discover the relationship between theory and practice.

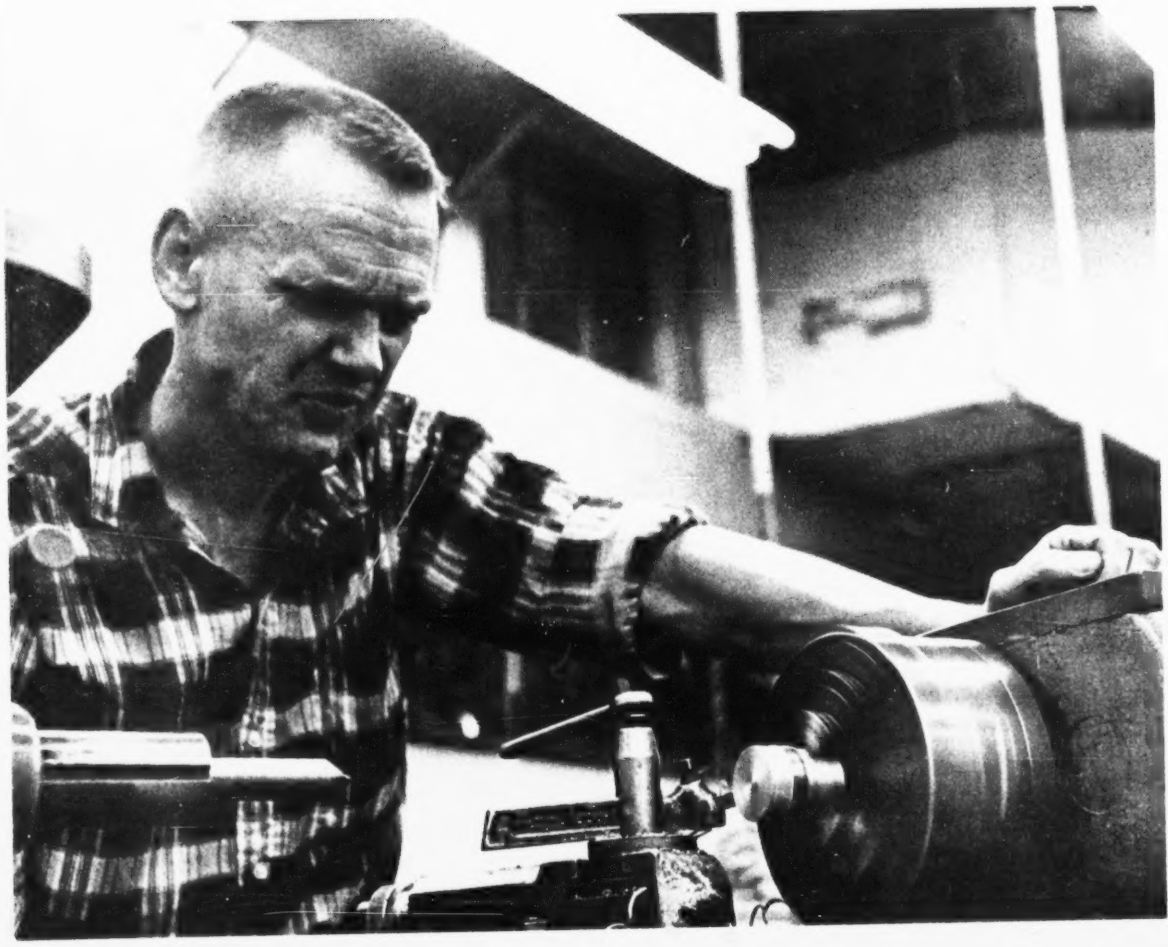
4. Further advances in the use of instructional technology depend in part on the compilation of a complete summary of present practices. This summary should include both objective and subjective data on the availability of materials, the methods of use, the teacher' s place in relation to the new media, and the administration of these materials. Since such information would establish a base for measuring further progress, a detailed and comprehensive study, designed to complement the attitude study previously suggested, should be made.

5. There is an urgent need for standards to guide administrators in their decision-making during the next five years. These standards should be sufficiently precise to be useful, yet flexible enough to satisfy local economic and cultural conditions. A report, setting out such standards in the area of technology in learning, summarizing historical developments in Ontario to date, and giving some indication of current trends and anticipated future developments, should be prepared.

REFERENCES

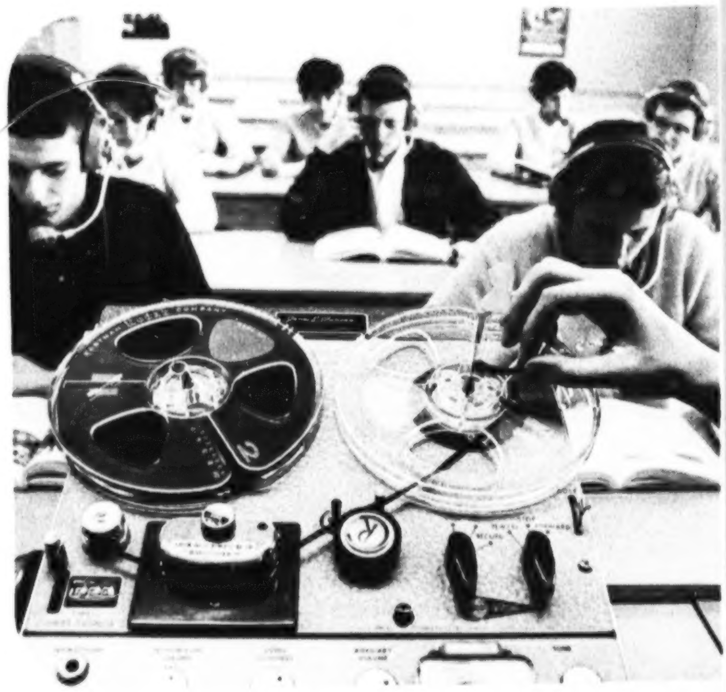
1. McLuhan, Understanding Media, McGraw-Hill, 1964
2. Henry M. Brickell, Organizing New York State for Educational Change, Albany, 1961

"Further exploration of the uses of technology in learning is necessary"



6. The Committee has assumed that widespread acceptance of testing methods which measure the non-verbal aspects of learning, would encourage non-verbal teaching. The validity of this assumption should be investigated, and new forms of testing should be devised and publicized if the assumption is proved correct.

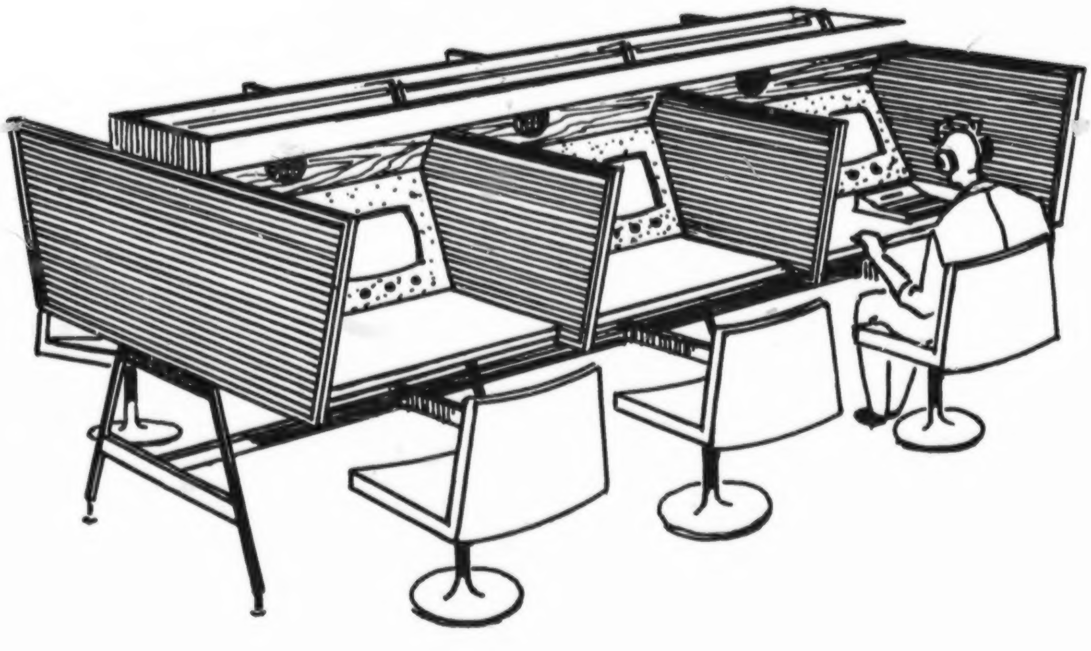
7. In view of the great disparity in budget allocations for the provision of learning resources, financial studies should be conducted in Ontario and in comparable regions elsewhere. This survey should result in the compilation of definite recommendations for per-pupil budgets to meet a variety of local conditions --- these recommendations to be made available to administrators.



FURTHER STUDY

8. Further exploration of the uses of technology in learning is necessary, and should involve existing organizations such as the Ontario College of Education, the training research departments of business and government, and the contributions of outstanding thinkers. It is recommended that a reconstituted committee be set up, and that its activities be expanded to include invitational seminars, interviews, and visits.

9. For purposes of co-operation and integration, as well as for avoidance of duplication, it is recommended that a committee such as is proposed in the preceding recommendation maintain close liaison with other Curriculum Institute committees, curriculum specialists, school planners, librarians and other groups interested in this field.



DEMONSTRATION PROJECTS

10. The benefits attainable by having full-time audio-visual co-ordinators and technical assistants in schools can be surmised, but concrete proof is lacking. It is recommended that experiments be conducted in several school systems to obtain data on the comparative effectiveness of several ways of deploying staff in a variety of audio-visual programmes. It is further recommended that school boards participating in these experiments should be given the material assistance required to provide the staff and facilities needed.

11. Experimentation with new equipment, modular storage units, and new materials is best conducted in selected classrooms. Experimental school programmes similar to "Project Discovery" should be carried on in this province. It is recommended that experimental schools be located throughout Ontario, and that a programme of field testing be instituted.

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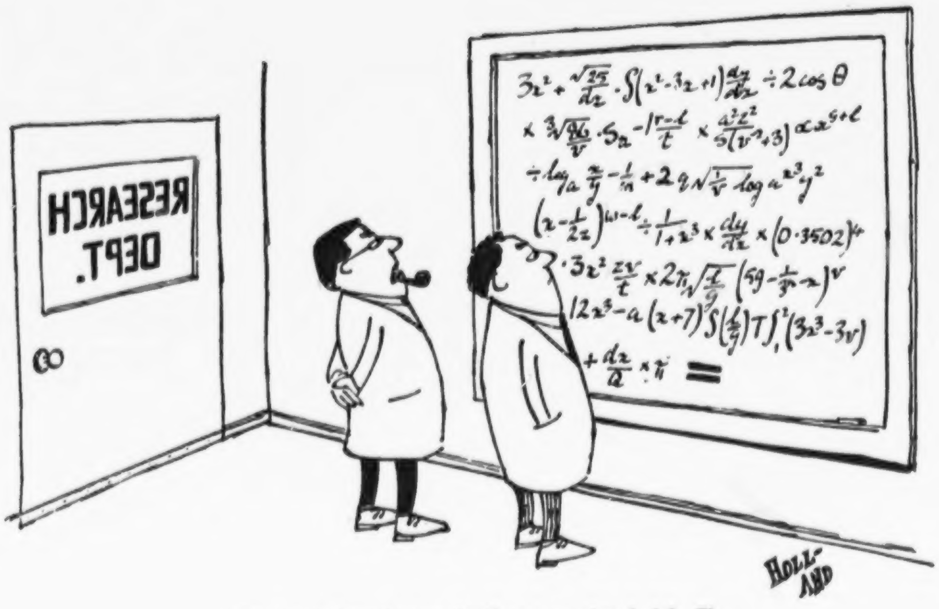
12. There is a need for prototype units to demonstrate both the concept of the library-teaching aids centre and the concept of the instructional materials preparation centre. Featured in these prototype set-ups would be: ready accessibility of a complete range of learning materials for both students and teachers, facilities for the production of inexpensive materials, and provision of a competent and enthusiastic staff. It is recommended that such centres be established in selected schools.

13. In order that teachers throughout the province should be enabled to see and to participate in demonstrations of effective preparation and use of instructional materials, it is recommended


RESEARCH
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'His last wish was that we should carry on where he left off.'

that a mobile unit or units, properly staffed and equipped, be provided for this purpose.

INFORMATION SERVICE

14. Teachers and administrators require both technical and pedagogical information dealing with this rapidly expanding field. To be effective, such information should utilize print and non-print media, and should be easily available from some central agency acting as a clearing-house. Examples of the services that could be provided include: kits of materials designed to enable administrators to inform teachers, board members, and the general public about the new media and their applications in the learning process; a simple yet comprehensive equipment buying guide; series of telecasts and films about the potentialities of the new media. Although such an information centre ultimately should operate on the national level, it is recommended that the Ontario Curriculum Institute take steps to establish this service on a provincial basis.

Since the above list of recommendations is much too extensive to be put into effect at one time, the Committee urges action by the Ontario Curriculum Institute on the specific recommendations shown in a phased arrangement on the following two pages.

A BEGINNING

This preliminary study has endowed the Committee members with the fruits of all true inquiry - it has revealed unexplored vistas, it has demanded structuring and patterning, and inevitably it has raised questions in geometric proportion to the answers it has found.

What then follows? As Brickell has said in his study of educational change in New York State, "The solution must be as great as the problem. A little more of anything - even a little more of everything we are already doing - would not be enough. What is needed is a solution in which the elements correspond to the elements of the problem".

The Committee members believe that opportunities do exist for obtaining solutions to the hydra-headed problem of the place of technology in the learning process. The elements of the problem can be identified, and the elements of the solution can be constructed, only if continued study, supported with substantial resources is permitted.

The stage is set and the opportunities are great for the educators of Ontario to participate in the drama of the developing technology. The need now is for direction during the coming years. It is within the power of the Ontario Curriculum Institute to provide this leadership.

It is consequently recommended that this study be continued under the general direction of the Committee, in the following four phases:

PHASE ONE	1965-66	a) further study and survey research b) experimental research c) commencement of an information service on a modest scale d) planning and experimentation for Phase Two
PHASE TWO	1966-67	a) extension of research b) establishment of prototype systems in school, university, college of education and administrative locales c) development of information service
PHASE THREE	1967-68	a) establishment through existing or newly-created agencies, of research, development, and information services on sound and continuing bases b) extension of services to a national base, perhaps as a Centennial project
PHASE FOUR	1968-69	a) support of O.C.I. to be gradually withdrawn and project terminated

The initiation of Phase One in 1965-66 will require a budget of $25,000. This will provide for:

1965-66

a) hiring of one person to devote full time to the project and to provide liaison with the research and development projects of Ontario Teachers' Federation, the Department of Educational Research, and the Division of School Planning and Building Research
b) secretarial research and other assistance as required
c) purchases and rental of materials, equipment, and services essential to specific projects
d) travel allowance to permit study by selected individuals of situations both inside and outside Ontario